PARIS CONFERENCE ABSTRACT

2018 9th International Conference on Environmental Science and Development (ICESD 2018)

NOVOTEL PARIS CRETEIL LE LAC

February 7-9, 2018, Paris, France

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Paris Conference Introductions

Welcome to 2018 HKCBEES Paris conference. This conference is organized by HKCBEES. The objective of the Paris conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Environmental Science and Development.

2018 9th International Conference on Environmental Science and Development (ICESD 2018)

Papers will be published in the following conference proceeding:

IOP Conference Series: Earth and Environmental Science (EES) (ISSN: 1755-1315)，which is indexed by EI Compendex, Scopus, Thomson Reuters (WoS), INSPEC,et al;

Conference website and email: http://www.icesd.org/; icesd@cbees.org

Presentation Instructions

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:

Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)
Digital Projectors and Screen
Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

Duration of each Presentation (Tentatively):

Regular Oral Presentation: about **12** Minutes of Presentation and **3** Minutes of Question and Answer
Keynote Speech: about **35** Minutes of Presentation and **5** Minutes of Question and Answer

Instructions for Poster Presentation

Materials Provided by the Conference Organizer:

The place to put poster

Materials Provided by the Presenters:

Home-made Posters
Maximum poster size is A1
Load Capacity: Holds up to 0.5 kg

Best Presentation Award

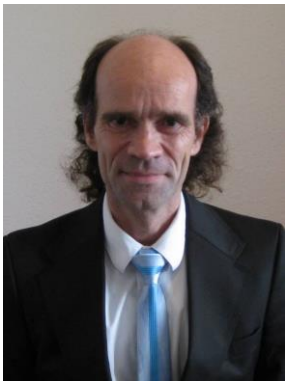
One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on February 7 and February 8, 2018.

Dress code

Please wear formal clothes or national representative of clothing.

Keynote Speaker Introductions

Keynote Speaker I



Prof. Hartmut Hinz
University of Applied Sciences, Frankfurt, Germany

H. Hinz received the diploma degree in electrical engineering from the University of Applied Sciences, Aachen and the Ruhr University, Bochum in Germany in the years 1990 and 1994 respectively. He received the Ph.D. degree from the Technical University, Darmstadt in Germany in 2000.
Between 1999 and 2009 he was with General Motors Fuel Cell Activities, most recently as project leader for the development of high voltage electrical systems for concept fuel cell. In 2009 he was appointed as a Professor for power electronics at the University of Applied Sciences, Frankfurt in Germany. Since 2011 he is the program director of the study program electrical engineering. Since 2010 he is a visiting Professor (flying faculty) at the Vietnamese-German University in Ho-Chi-Minh City, Vietnam. His research interests are in the areas power electronics, modeling and decentralized power generation.

Topic: “Power electronics for traditional and emerging industrial applications”

Abstract—Power electronics are one of the biggest economic drivers for several decades. It is a key technology in numerous traditional applications like industrial production and automation, traction and automotive sector, telecommunication and aerospace systems, consumer electronics and white goods market or medical devices. Power electronics are present in our daily lives. Based on the principle of electronic switching power electronics provides a continuous conversion of the physical quantities voltage, current and power with high efficiency. Furthermore the development of power electronics is driven by emerging markets like electric vehicles, renewable energies and smart grids.

In the presentation first the basics of power electronic systems are introduced. Next the state-of the art of semiconductor technology and future trends are explained. Furthermore traditional and emerging applications as listed above are discussed. Finally the market worth is analyzed.

Keynote Speaker II

Prof. Khalil Hanna
Graduate Engineering School of Chemistry of Rennes, France

Khalil Hanna is currently a full Professor of Chemistry at the Graduate Engineering School of Chemistry of Rennes (France). He earned his PhD (2004) in Environmental Science and Technology from INSA de Lyon. His research interests focus on iron-mediated reactions for soil and water treatments and an improved understanding of sorption and heterogeneous redox reactions taking place at oxide/water interface. His research group in Rennes is engaged in elucidating molecular-scale reactions at mineral surfaces, and in translating molecular-level information to observations made at the larger scales using thermodynamics and reactive transport modeling. He has published over 100 peer-reviewed original research articles in top international journals (h-index=31 and over 3000 total citations). He has developed several programs and collaborations with international research institutes, and has been invited to give talks and seminars at numerous prestigious universities and international conferences. He also serves as a guest editor of the international journals including Environmental Science and Pollution Research (Springer), and as an Associate Editor of Applied Geochemistry (Elsevier).

Topic: “Implications of Fe chemistry in environmental processes”

Abstract—Fe oxides are generally the dominant redox-active components in soils, sediments, and other oxide-rich environments. These metal oxides can vary widely in physical and chemical characteristics, and exist as micro- and nano-sized particles. From an engineering point of view, Fe-mediated redox reactions can be potentially applicable for environmental remediation and protection. Different forms of iron have been tested for activity against several different classes of environmental pollutants and for possible use as part of an environmental remediation technology. These have included microscale/nanoscale zero-valent iron particles, iron oxhydroxides, iron supported silica or pillared clays, and others. One of the most promising avenues of research involves the use of Fe^{0}- or Fe^{II}-based materials for the reductive transformation of halogenated compounds, nitrocompounds and oxyanions. Another engineering application is the use of Fe-based materials as catalysts for the chemical oxidation of recalcitrant pollutants via Fenton reactions.

Overall, this speech outlines both environmental and engineering aspects of the uses and implications of Fe in environmental cleanup processes. In particularly, this presentation gives the most recent results from our group about the use of iron in remediation processes including sorption and redox reactions.

Keynote Speaker III

Prof. Miklas Scholz
Faculty of Engineering, Lund University, Sweden

Prof. Miklas Scholz, cand Ing, BEng (equiv), PgC, MSc, PhD, DSc, CWEM, CEnv, CSci, CEng, FHEA, FIEMA, FCIWEM, FICE, Fellow of IWA, VINNOVA Fellow, Marie Curie Senior Fellow, holds the Chair in Civil Engineering at The University of Salford (UoS, UK), is also a Professor in Water Resources Engineering at Lund University (LU, Sweden) and a Visiting Professor at the University of Johannesburg (UoJ). He has published three books and 206 journal articles. Prof. Scholz has citations of more than 3978, resulting in an h-index of 31 and an i10-Index of 91.

Professor and Chair in Civil Engineering, Civil Engineering Research Group, School of Computing, Science and Engineering, The University of Salford, Newton Building, Peel Park Campus, Salford, Greater Manchester M5 4WT, United Kingdom

Professor in Water Resources Engineering, Division of Water Resources Engineering, Department of Building and Environmental Technology, Faculty of Engineering, Lund University, P.O. Box 118, 221 00 Lund, Sweden

Distinguished Professor in Civil Engineering Science, Department of Civil Engineering Science, School of Civil Engineering and the Built Environment, University of Johannesburg, Kingsway Campus, PO Box 524, Aukland Park 2006, Johannesburg, South Africa

Topic: “Wetland Systems Used for Flood and Diffuse Pollution Control: Integration of Hydro-environment, Energy and Decision Making”

Abstract—The presentation will introduce wetland systems used for flood and diffuse pollution control purposes to a wide audience of environmental scientists and engineers. The control of pollution, is attractive to an audience of both academics and practitioners. This contribution covers broad water and environmental engineering aspects relevant for the drainage and treatment of storm water and wastewater, providing a descriptive overview of common complex black box treatment systems and general design issues involved. However, the focus will be on the integration of hydro-environment, energy and decision making, which is highlighted in representative research and case studies.

Fundamental science and engineering principles are explained to address the student and the professional audience. Standard and novel design recommendations for, predominately, constructed wetlands and related sustainable drainage systems are provided to account for the interests of professional engineers and environmental scientists. The latest research findings in wastewater treatment and runoff control are discussed to inform academics and senior consultants. The presentation deals comprehensively not only with the design, operation, maintenance and water quality monitoring of traditional and novel wetland systems, but also with the analysis of asset performance and modeling of treatment processes and performances of existing infrastructure — predominantly in developed but also in developing countries — and the sustainability and economic issues involved.

Basic scientific principles should be of interest to all concerned with the built environment, including town planners, developers, engineering technicians, agricultural engineers and public health workers. The presentation targets a wide audience, but sufficient hot research topics are also addressed. Solutions to pressing water quality problems associated with constructed treatment wetlands, integrated constructed wetlands, farm constructed wetlands and stormwater ponds, and other sustainable biological filtration and treatment technologies linked to public health engineering are explained.

Case study topics are diverse: wetlands, including natural wetlands and constructed treatment wetlands; sustainable water management, including sustainable drainage systems; and specific applications such as wetlands treating hydrocarbon and piggery wastewater. The research projects are multidisciplinary, holistic, experimental and modeling-oriented.

The presentation tries to integrate natural and constructed wetlands as well as sustainable drainage techniques into traditional water and wastewater systems used to treat surface runoff and associated diffuse pollution. Therefore, water quality management and water and wastewater treatment fundamentals are being introduced.

Preliminary and predominantly primary treatment units that can be combined with wetland systems are outlined. Secondary and tertiary treatment technologies that can be used in combination with wetland technologies or as alternatives in cases where land availability is restricted due to costs are presented.

Wetland science and biological treatment processes based on microbial biodegradation are highlighted. Examples of different wetland are also presented. A wide variety of timely applied research case studies related to constructed wetlands and associated technologies for runoff and diffuse pollution treatment are covered. Moreover, wetlands such as sustainable flood retention basins used for both diffuse pollution and flood control purposes are introduced.

Keynote Speaker IV

Prof. Susan Richardson
University of South Carolina, USA

Susan D. Richardson is the Arthur Sease Williams Professor of Chemistry in the Department of Chemistry and Biochemistry at the University of South Carolina. Prior to coming to USC in January 2014, she was a Research Chemist for several years at the U.S. EPA's National Exposure Research Laboratory in Athens, GA. For the last several years, Susan has been conducting research in drinking water—specifically in the study of toxicologically important disinfection by-products (DBPs). Susan is the recipient of the 2008 American Chemical Society Award for Creative Advancements in Environmental Science & Technology, has received an honorary doctorate from Cape Breton University in Canada (2006), and was recently recognized as an ACS Fellow (2016). She also serves as an Associate Editor of Environmental Science & Technology and for Water Research and is on the Editorial Advisory Board of Rapid Communications in Mass Spectrometry, Journal of Hazardous Materials, Environmental Science and Pollution Research, and Journal of Environmental Sciences. Susan has published more than 130 journal articles and book chapters and has written many invited biennial reviews for the journal Analytical Chemistry—on Emerging Contaminants in Water Analysis and Environmental Mass Spectrometry, She has a Ph.D. in Chemistry from Emory University and a B.S. in Chemistry & Mathematics from Georgia College & State University.

Topic: “Emerging Environmental Contaminants in Water: State of the Science”

Abstract—Environmental research continues to expand beyond traditional, regulated contaminants to emerging contaminants, such as sucralose and other artificial sweeteners, nanomaterials, perfluorinated compounds, pharmaceuticals, hormones, drinking water and swimming pool disinfection by-products (DBPs), 1,4-dioxane, sunscreens/UV filters, flame retardants, benzotriazoles, naphthenic acids, algal toxins, and new contaminants on the horizon: ionic liquids and microplastics. These are now frequently being found in water samples, including rivers, lakes, ground water, and drinking water. Moreover, understanding their fate and transport in the environment and in wastewater/drinking water treatment is vitally important, and as such, one of the major trends continues to be in identifying their transformation products. Because environmental samples are inherently complex mixtures with trace-level contaminants, the development of sensitive and modern analytical tools has been key for their identification and measurement. This presentation will provide an overview of the state of the science for emerging contaminants, their formation and transformation in the environment, and the modern tools used to measure them.

Keynote Speaker V

Prof. Dr. rer. nat. Michael Schmidt
Offenburg University of Applied Sciences, Germany

Michael Schmidt received his Diploma degree and his Doctorate degree in mathematics from the Technical University of Berlin in 2002 and 2007, respectively. A part of his studies and research he conducted at the Université de Nantes and at the École Supérieure d'Électricité in Paris.

From 2008 to 2013 he was with GE Global Research, Munich, initially as project lead and later as head of the research department "Renewable Energy and Power Systems". In 2013 he became a Professor at the University of Applied Sciences in Saarbrücken. Since 2014, he has been a Professor at the Department of Electrical Engineering and Information Technology of the Offenburg University of Applied Sciences.

His main areas of research interest are the optimization of renewable energy systems, their grid integration, and managing the variability of renewable energy sources.

Topic: “The Electrical Grid – Quo Vadis?”

Abstract—In principle, electrical grids today still look the same as they did a hundred years ago, whereas other technology fields like communication and production have undergone fundamental changes through computers, automation and digitalization.

Today, electrical grids are facing huge challenges: On the one hand, global energy needs are steadily increasing due to the growth of the world population and wealth, which also leads to an increase of the global electricity demand. On the other hand, the currently prevailing fossil fuels must be replaced by climate-neutral renewable energy sources, which – in the case of solar and wind - are unsteady, uncontrollable and decentralized. The increase in electricity demand is intensified by a general electrification trend, notably in the areas of mobility and of heat and cold supply (e.g. heat pumps).

Consequently, electrical grids must evolve quickly and fundamentally to meet these challenges of the years to come. Some open questions are: How much renewable generation capacity and storage are needed to compensate for fossil and possible nuclear fuels? How much efficiency of the electrical grids can be leveraged by “smart grid technologies” on the basis of modern information and communication technology? How much and which new infrastructure in the transmission and distribution grids is needed anyway? How must business models, markets and regulations change so that the necessary and possible changes are implemented?

This talk starts with a short historical outline and an overview of the challenges before it tries to give partial answers to some of the mentioned questions. Finally it describes ideas and experiences from a large German demonstration project on future energy system concepts.

Keynote Speaker VI

Prof. Slav Hermanowicz
University of California at Berkeley, USA

Slav Hermanowicz is a professor at the University of California at Berkeley where he has conducted research and teaching in the area of environmental protection with special emphasis on physical sustainability, water and wastewater treatment, and water management. The focus of his research is on metrics of sustainability, integrated water management, water reuse, biological processes in water and wastewater, membrane bioreactors, and biostability of drinking water. He was a National High-End Foreign Expert of China at the Tongji University in Shanghai where currently he manages projects on wastewater treatment and water reuse as 111 Program Honorary Visiting Professor. Recently, Slav became a Core Principal Investigator at the Tsinghua Berkeley Shenzhen Institute (TBSI), a collaborative project between Berkeley and Tsinghua University. He was a Fellow at the Institute of Earth System Preservation of the European Academy of Sciences and Arts. Among his most important awards was the inaugural Fulbright Distinguished Chair in Sustainability at the University of Natural Resources and Applied Life Sciences (BOKU) in Vienna. Slav is also involved in entrepreneurship both as an academic activity in teaching entrepreneurship and as a practitioner. He has been educated in his native Poland (M.Sc.) and at the University of Toronto (Ph.D.).

Topic: “Will Water Be the ‘Oil of the 21st Century’? A quest for sustainable water management”

Abstract—Water became recognized as a limiting natural resource. In popular culture, water importance is compared to oil. This lecture will examine parallels and contrasts between these two natural resources. The benefits of safe water supply extend beyond simple human needs and extend into many aspects of economy and society. While water is an ultimate renewable resource its availability depends on many natural, technical, economic, social and political factors. Global climate change, distribution of water resources, water transfers and virtual water trade, energy, and finance are some of the factors affecting actual water supply in a local context. The future of sustainable water management will depend as much on augmentation of available resources, conservation, better management and recycle as on changes of social and institutional attitudes to water. The future of water sustainability will not be simple but some positive trends already emerge.

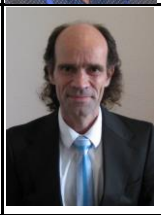
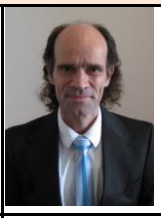
Brief Schedule for Conference

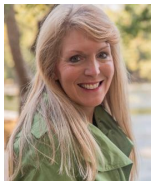
<table>
<tr><td rowspan="5">Day 1
February 7
2018
Wednesday</td><td colspan="3">Registration 9:30~17:00
Venue: Echat à Breches</td></tr>
<tr><td colspan="3">Afternoon Conference
Venue: Echat à Breches/Pompadour-Meches</td></tr>
<tr><td colspan="3">Opening Remarks 13:00~13:05
Keynote Speech I 13:05~13:45
Keynote Speech II 13:45~14:25
Coffee Break 14:25~14:50</td></tr>
<tr><td colspan="2">Session 1: 14:50~17:05
Venue: Echat à Breches
9 presentations
Building Energy System and Power System Management</td><td>Session 2: 14:50~16:50
Venue: Pompadour-Meches
8 presentations
Air Pollution Monitoring and Emission Reduction</td></tr>
<tr><td rowspan="8">Day 2
February 8
2018
Thursday</td><td colspan="3">Registration 8:30~17:30
Venue: Outside of the Conference Room</td></tr>
<tr><td colspan="3">Morning Conference
Venue: Montaigut to Pompadour</td></tr>
<tr><td colspan="3">Opening Remarks 8:55~9:00
Keynote Speech III 9:00~09:40
Keynote Speech IV 9:40~10:20
Coffee Break 10:20~10:45
Keynote Speech V 10:45~11:25
Keynote Speech VI 11:25~12:05</td></tr>
<tr><td colspan="3">Lunch 12:05~13:30</td></tr>
<tr><td colspan="3">Afternoon Conference</td></tr>
<tr><td>Venue: Montaigut to Haies</td><td>Venue: Meches to Pompadour</td><td>Venue: Palais + Breches</td></tr>
<tr><td>Session 3: 13:30~16:00
10 presentations
Chemical Engineering</td><td>Session 4: 13:30~15:45
9 presentations
Resources and Environmental Management</td><td>Session 5: 13:30~15:45
9 presentations
Renewable Energy Generation and Assessment</td></tr>
<tr><td colspan="3">Coffee Break 15:45~16:15</td></tr>
<tr><td>Session 6: 16:15~18:45
10 presentations
Urban Planning and Sustainable Development</td><td>Session 7: 16:15~18:45
10 presentations
Energy and Power Engineering</td><td>Session 8: 16:15~18:30
9 presentations
Water Resource Management and Wastewater Treatment</td></tr>
</table>

	Dinner 18:45
Day 3 **February 9** **2018** **Friday**	**9:00~17:00** **One Day Tour**

Tips: Please arrive at the conference to upload or copy PPT into the laptop room 10 minutes before the session begins.

Detailed Schedule for Conference

February 7, 2018 (Wednesday) **Venue: Echat à Breches/ Pompadour-Meches**		
13:00~13:05		**Opening Remarks** Prof. Khalil Hanna Graduate Engineering School of Chemistry of Rennes, France
13:05~13:45		**Keynote Speech I** Prof. Hartmut Hinz University of Applied Sciences, Frankfurt, Germany Topic: "Power electronics for traditional and emerging industrial applications"
13:45~14:25		**Keynote Speech II** Prof. Khalil Hanna Graduate Engineering School of Chemistry of Rennes, France Topic: "Implications of Fe chemistry in environmental processes"
14:25~14:50	**Coffee Break & Group Photo Taking**	
14:50~17:05	**Session 1-9 presentations** **Topic: "Building Energy System and Power System Management"**	
14:50~16:50	**Session 2-8 presentations** **Topic: "Air Pollution Monitoring and Emission Reduction"**	
February 8, 2018 (Thursday) **Venue: Montaigut to Pompadour/ Palais + Breches**		
8:55~9:00		**Opening Remarks** Prof. Hartmut Hinz University of Applied Sciences, Frankfurt, Germany
9:00~09:40		**Keynote Speech III** Prof. Miklas Scholz Faculty of Engineering, Lund University, Sweden Topic: "Wetland Systems Used for Flood and Diffuse Pollution Control: Integration of Hydro-environment, Energy and Decision Making"

9:40~10:20	 **Keynote Speech IV** Prof. Susan Richardson University of South Carolina, USA Topic: "Emerging Environmental Contaminants in Water: State of the Science"
10:20~10:45	**Coffee Break & Group Photo Taking**
10:45~11:25	 **Keynote Speech V** Prof. Dr. rer. nat. Michael Schmidt Offenburg University of Applied Sciences, Germany Topic: "The Electrical Grid – Quo Vadis?"
11:25~12:05	 **Keynote Speech VI** Prof. Slav Hermanowicz University of California at Berkeley, USA Topic: "Will Water Be the 'Oil of the 21st Century'? A quest for sustainable water management"
12:05~13:30	**Lunch** **Novotel Créteil Le Lac Restaurant**
13:30~16:00	**Session 3-10 presentations** **Topic: "Chemical Engineering"**
13:30~15:45	**Session 4-9 presentations** **Topic: "Resources and Environmental Management"**
13:30~15:45	**Session 5-9 presentations** **Topic: "Renewable Energy Generation and Assessment"**
15:45~16:15	**Coffee Break**
16:15~18:45	**Session 6-10 presentations** **Topic: "Urban Planning and Sustainable Development"**
16:15~18:45	**Session 7-10 presentations** **Topic: "Energy and Power Engineering"**
16:15~18:30	**Session 8-9 presentations** **Topic: "Water Resource Management and Wastewater Treatment"**
18:45	**Dinner** **Novotel Créteil Le Lac Restaurant**

Note: (1) The registration can also be done at any time during the conference.

(2) The organizer doesn't provide accommodation, and we suggest you make an early reservation.

(3) One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on February 7 and February 8, 2018.

Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat àBreches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0013 Presentation 1 (14:50~15:05)

Designing Girls' Dormitory with an Emphasis on Renewable Energy at University of Tehran, Science &Research Campus
Fatemeh Daneshvar Tarigh and Alireza Daneshvar Tarigh
Science and Research University of Tehran, Iran

Abstract—Student dormitory is the Second home of the audience of a scholar environment that are living in a group of rooms temporarily, to make friends, save money, to be close to their classes and independent of their family. This housing is not just a shelter, but it follows the educational goals of the university. The way of designing the dormitory will have a direct impact on the performance of the students and therefore requires a lot of attention. This includes but not limited to a place which is convenient, mostly independent and disturbance-free with an acceptable air condition and ventilation. The most important aspect of such a place is saving energy in a way that does not decrease the quality of student's life. On the other hand, the type of usage of such buildings causes different presence time and different ideas about the lights and temperature's set point. In this paper, we want to design a dormitory which is comfortable and energy-efficient by using renewable energies such as solar energy to produce needed electricity and wind for natural ventilation and above all, using architectural techniques to lower the energy consumption.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat à Breches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0020 Presentation 2 (15:05~15:20)

Comparative analysis of heat dissipation panels for a hybrid cooling system integrated in buildings

Amaia Zuazua-Ros, Juan Carlos Ramos, César Martín-Gómez, Tomás Gómez-Acebo and Andrea Pisano
Building Services and Structures Department, Universidad de Navarra, Pamplona, Spain

Abstract—The use of cooling panels as heat dissipation elements integrated in buildings has been previously investigated by these authors. Those elements would be connected to the condenser and would dissipate the heat in a passive form. Following this research, this study analyses and compares the thermal performance of two heat dissipation panels as part of a hybrid cooling system. Both panels were experimentally tested under different variables, thus having nine scenarios for each panel. Additionally, an already validated model was applied. The empirical results show a considerable difference between the cooling capacity among them, doubling the daily average ratio in one scenario. The heat dissipation ratios vary between 106 and 227 W/m2 in the first case and 140 and 413 W/m2 in the second. Regarding the model applicability, the average error for each panel was 4.0% and 8.5%. The connection between the metal sheet and the pipes of the panels has proven to be the main parameter to assure the highest heat dissipation potential of each panel.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat à Breches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0034 Presentation 3 (15:20~15:35)

A Comparative Study of Fluorescent and LED Lighting in Industrial Facilities

C Perdahci, H C Akin and O Cekic
Electrical Engineering Department, University of Kocaeli, Turkey;
Alkan Asia Africa Lighting Co., Fevzi Alkan Street, Turkey

Abstract—Industrial facilities have always been in search for reducing outgoings and minimizing energy consumption. Rapid developments in lighting technology require more energy efficient solutions not only for industries but also for many sectors and for households. Addition of solid-state technology has brought LED lamps into play and with LED lamp usage, efficacy level has reached its current values. Lighting systems which uses fluorescent and LED lamps have become the prior choice for many industrial facilities. This paper presents a comparative study about fluorescent and LED based indoor lighting systems for a warehouse building in an industrial facility in terms of lighting distribution values, colour rendering, power consumption, energy efficiency and visual comfort. Both scenarios have been modelled and simulated by using Relux and photometric data for the luminaires have been gathered by conducting tests and measurements in an accredited laboratory.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat à Breches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0021 Presentation 4 (15:35~15:50)

Passive designs and renewable energy systems optimization of a net zero energy building in Embrun/France

Fatima Harkouss, Pascal Biwole and Farouk Fardoun
University Institute of Technology, Department GIM, Lebanese University, Saida, Lebanon

Abstract—Buildings' optimization is a smart method to inspect the available design choices starting from passive strategies, to energy efficient systems and finally towards the adequate renewable energy system to be implemented. This paper outlines the methodology and the cost-effectiveness potential for optimizing the design of net-zero energy building in a French city; Embrun. The non-dominated sorting genetic algorithm is chosen in order to minimize thermal, electrical demands and life cycle cost while reaching the net zero energy balance; and thus getting the Pareto-front. Elimination and Choice Expressing the Reality decision making method is applied to the Pareto-front so as to obtain one optimal solution. A wide range of energy efficiency measures are investigated, besides solar energy systems are employed to produce required electricity and hot water for domestic purposes. The results indicate that the appropriate selection of the passive parameters is very important and critical in reducing the building energy consumption. The optimum design parameters yield to a decrease of building's thermal loads and life cycle cost by 32.96% and 14.47% respectively.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat à Breches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0024 Presentation 5 (15:50~16:05)

Probabilistic behaviour models of occupants to predict buildings' energetic performance
Walid Belazi, Salah-Eddine Ouldboukhitine, Alaa Chateauneuf, M'hamed Bouzidi, Hamid Bouchair.
IUT Montlu ϙn, Blaise Pascal University, Institute Pascal, France

Abstract—Occupants' behavior towards heating and cooling systems set points is a very complex process that has been under investigation for the last years. In fact, almost all dynamic energy simulation tools consider energy consumption as fully deterministic using fixed and unrealistic schedules. However, their ability to predict energy consumption is undermined by the poor representation of occupants' interaction with the indoor environment. In this study, occupants' behavior for a case study residential building is modeled according to a probabilistic approach. Occupants' behavior related to the adjustment of thermostat set-points is suggested based on experimental measurements and monitoring of different environment parameters, including internal air temperature, ambient temperature, internal and external relative humidity, internal amount of CO2. The Logistic regression methodology is adopted to calculate the probability of changing the thermostat set-point by a random occupant, in terms of different environmental parameter s stated before. The results yield to a tough stochastic model that may be implemented in different simulation softwares, in order to take into account occupants' behavior in the building, besides to properly simulate the yearly energy consumption.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat à Breches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0012 Presentation 6 (16:05~16:20)

Viability of using energy storage for frequency regulation on power grid
Y S Lim, **L C Hau**, K Y Loh, K Y Lim, P F Lyons and P C Taylor
Universiti Tunku Abdul Rahman, Malaysia

Abstract—This project is about the development and integration of a real-time network simulator in the laboratory using hardware in the loop (HIL) for the purpose of frequency regulation. Frequency regulation is done using the energy storage system (ESS) and a real-time network test bed developed in the smart energy laboratory in Newcastle University. An IEEE Test System was built in the OPAL-RT network simulator to mimic the power grid with renewable energy sources. The study demonstrates the viability of using an ESS to regulate the frequency under an increased penetration of renewable energy sources.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat à Breches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0030 Presentation 7 (16:20~16:35)

Analysis of Turbine-grid Interaction of Grid-connected Wind Turbine Using HHT
A Chen, W Wu, J Miao and D Xie
Shanghai Jiao Tong University, China

Abstract—This paper processes the output power of the grid-connected wind turbine with the denoising and extracting method based on Hilbert Huang transform (HHT) to discuss the turbine-grid interaction. At first, the detailed Empirical Mode Decomposition (EMD) and the Hilbert Transform (HT) are introduced. Then, on the premise of decomposing the output power of the grid-connected wind turbine into a series of Intrinsic Mode Functions (IMFs), energy ratio and power volatility are calculated to detect the unessential components. Meanwhile, combined with vibration function of turbine-grid interaction, data fitting of instantaneous amplitude and phase of each IMF is implemented to extract characteristic parameters of different interactions. Finally, utilizing measured data of actual parallel-operated wind turbines in China, this work accurately obtains the characteristic parameters of turbine-grid interaction of grid-connected wind turbine.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat àBreches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0047 Presentation 8 (16:35~16:50)

A New Dispatch Control Integration System of the Smart Grid based on the Regional Network Centralized Protected Mode

Zhang Peng, Liu Na, Chang Jing， Zhao Qi-feng, Lin Man-man
Zhongyuan University of Technology, Zhengzhou, China

Abstract—The hierarchical management and monitor model is a popular approach for the dispatch control mode of the smart grid. However, this model has many defects, e.g., the management of the data flow in the dispatch control system is very difficult, and the running efficiency of the dispatch control system is very bad too. This paper presents a regional network centralized protected mode (RNCPM) of the smart grid and establishes a new dispatch control integration system (DCIS) of the smart grid. The system architecture and key technologies of the DCIS based on RNCPM are proposed. A new communication architecture and the new features of the unified cross-section panoramic data (UCSPA) is studied. A new scheduling operation and management mode and panoramic data system platform of smart grid are developed. The DCIS under RNCPM can have integrated the schedule and monitor of the smart grid. The proposed system will lead to a new operation and maintenance mode of smart grid. The new system will further optimize the scheduling and workflow transformer of the substation. And the overall level of smart grid security and emergency levels will be significant raised.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~17:05

Venue: Echat à Breches

9 presentations- Topic: "Building Energy System and Power System Management"

Session Chair 1: Prof. Hartmut Hinz

S0032 Presentation 9 (16:50~17:05)

Simulation of load-sharing in standalone distributed generation system

Titus O Ajewole, Robert P M Craven, Olakunle Kayode and Olufisayo S Babalola
Department of Electrical and Electronic Engineering, Osun State University, Osogbo, Nigeria

Abstract—This paper presents a study on load-sharing among the component generating units of a multi-source electric microgrid that is operated as an autonomous ac supply-mode system. Emerging trend in power system development permits deployment of microgrids for standalone or stand-by applications, thereby requiring active- and reactive power sharing among the discrete generating units contained in hybrid-source microgrids. In this study, therefore, a laboratory-scale model of a microgrid energized with three renewable energy-based sources is employed as a simulation platform to investigate power sharing among the power-generating units. Each source is represented by a source emulator that captures the real operational characteristics of the mimicked generating unit and, with implementation of real-life weather data and load profiles on the model; the sharing of the load among the generating units is investigated. There is a proportionate generation of power by the three source emulators, with their frequencies perfectly synchronized at the point of common coupling as a result of balance flow of power among them. This hybrid topology of renewable energy-based microgrid could therefore be seamlessly adapted into national energy mix by the indigenous electric utility providers in Nigeria.

Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~16:50

Venue: Pompadour-Meches

8 presentations- Topic: "Air Pollution Monitoring and Emission Reduction"

Session Chair 2: Prof. Khalil Hanna

S0027 Presentation 1 (14:50~15:05)

Temperature effect on PCDD/F formation from 2,4,6-trichlorophenol added MFA
Ishrat Mubeen, Alfons Buekens, Shengyong Lu and Jianhua Yan
Zhejiang university, China

Abstract—Municipal solid waste incinerators (MSWI) are one of the principal sources of PCDD/F. Fly ash from incinerators contain all ingredients necessary for forming dioxins, including carbon, precursors (like chlorophenols CP and chlorobenzenes CBz), chlorides, and metal catalysts. Catalytic condensation of chlorophenol (CP) precursors yield specific congeners. Present work is focused on PCDD/F fingerprints in 2,4,6-trichlorophenol (TCP) added model fly ash (MFA) at selected temperatures in 10% O2 and in pure nitrogen. For preparation of MFA, AC (2.5 wt. %), sodium chloride (NaCl; 10 wt. % Cl), 0.2 wt. % copper chloride (CuCl2) and silica (SiO2) for the balance were mixed by grinding them together in a mortar for about 10 min. MFA samples were run at 150, 200, 250, 300, 350 and 400 ℃ in 10% and in pure nitrogen (400 ℃ not tested in pure nitrogen) at single gas flow rate (300 mL/min) and time (1 h). Precursor was added at uniform rate through motorized mirosyring pump into the gas stream. Maximum PCDD/F were obtained at 300 ℃ and T4CDD, P5CDD and O8CDF were dominant homologues in 10% O2, while in anoxic conditions at 200 and 300 ℃, T4CDD were most dominant homologues. In all tested conditions with 0.7 % TCP addition 1,3,6,8-, 1,3,7,9- tetrachlorodibenzo-p-dioxins (T4CDD), 1,2,4,7,9-, 1,2,3,6,8-, 1,2,3,7,9- pentachlorodibenzo-p-dioxins (P5CDD) and 1,2,3,4,6,8-hexachlorodibenzo-p-dioxins (H6CDD) isomers have major distribution among all PCDD isomers. De-novo reaction in presence of precursor seems to occur very fast even for a 10 min reaction time. PCDD and PCDF output changes with temperature, while Cl-PCDD remains higher than Cl-PCDF at all selected conditions. Low PCDF/PCDD ratio of some samples suggests their marked preference for the CP-precursor route, whereas, CuCl2 favours PCDF formation, the ratio of PCDF/PCDD increased with temperature in oxygen atmosphere.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~16:50

Venue: Pompadour-Meches

8 presentations- Topic: "Air Pollution Monitoring and Emission Reduction"

Session Chair 2: Prof. Khalil Hanna

D0012 Presentation 2 (15:05~15:20)

Integrated Assesssment Modelling of Air Pollution in Mumbai - An application of DPSIR framework

Abhishek Kumar and Shashikant Kamble
Indian Institute of Technology (Indian School of Mines), Dhanbad, Jharkhand, India

Abstract—Mumbai's air pollution has grown dramatically in recent years. Industrial emission, construction activities, the burning of refuse and vehicles exhausts are combining to produce unacceptably high levels of nitrogen oxides and particulate matter in Mumbai's air. The WHO's Ambient air pollution database for 2016 showed that the average level of PM10 pollution in Mumbai is 132 $\mu g/m^3$, which is far away above the normal level. Moreover, WHO's International Agency for Research on Cancer warns Mumbai that air is contaminated with cancer causing particles. Considering Mumbai's air pollution is threating thecity growing importance as a player in the global economic stage, this paper aims to incorporate the investigation of air pollution in Mumbai through a Driver – Pressure – State – Impact – Response model. Based on analysis using DPSIR framework, this paper discusses some of the socio - economic driving forces of the air pollution , with a focus on energy use, growing population, urbanisation and transportation. The paper also analyses and observed changes owing to pressure exerted on Industries and transportation sysytem because of driving forces, Increase in emission pollutants , the resulting impacts on ecosysytem functions and possible policy response

The results show that the model is an effective tool allowing the investigation of air pollution in Mumbai and contributing to the body of knowledge by aiding generation of realistic and practical measures. The model also serves as a database for policymakers and stakeholders to develop an effective and efficient Air Quality Management Plan of Mumbai.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~16:50

Venue: Pompadour-Meches

8 presentations- Topic: "Air Pollution Monitoring and Emission Reduction"

Session Chair 2: Prof. Khalil Hanna

D0017 Presentation 3 (15:20~15:35)

Application of Supernetwork on transportation carbon emission modelling
Gengzhe Wang, Qi Han, Feixiong Liao, Bauke de Vries
Technische Universiteit Eindhoven, Eindhoven, Noord-Brabant, Netherland

Abstract—As one of the main component of low carbon city planning, transport sector contributes 30% energy-related CO_2 emissions in the EU. It attracted much attention due to the importance on economy and inflexible in GHG reduction. Transport carbon emission is highly related to the travel behavior of commuters, including traffic mode, commuting amounts, and length of trip. Comparing with field investigation and trip survey, transportation modeling has been proved as a more flexible approach to obtain related data. The multi-state supernetwork approach is a promising way to model travel behavior of individuals, it is capable to represent choice of mode, route, and parking at a high detail level. The simulation result is able to provide an important support for transport carbon emission modeling. In this paper, trip survey of Eindhoven is applied in multi-state supernetwork model to simulate travel behavior of individual commuter. Based on the simulation result, the spatial distribution of transport CO_2 emission can be illustrated through GIS platform. The illustration concerns hypothetical land-use scenarios for the city of focusing on low carbon development, travel preferences of commuters can be accommodated to the substituted land use scenario. It is possible to identify the land use strategies for reducing transportation CO_2 emissions and mitigating global climate change emission in the scope of urban planning.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~16:50

Venue: Pompadour-Meches

8 presentations- Topic: “Air Pollution Monitoring and Emission Reduction”

Session Chair 2: Prof. Khalil Hanna

D0031 Presentation 4 (15:35~15:50)

Methane emissions from Ecuadorian hydropower dams
M A Paucar, P I Amancha, T D San Antonio, **L P Acurio**, A F Valencia, C Galarza
Technical University of Ambato, Av. Los Chasquis & R ó Payamino, Ambato, Ecuador

Abstract—Climate change is one of the most critical environmental problems nowadays. This change is caused by greenhouse effect, which is related to anthropogenic activities as gases production by fossil fuels and industrial production. Methane emission was evaluated in five Ecuadorian hydropower dams with the Intergovernmental Panel on Climate Change methodology. The average emission was 168,741 tCO_2eq per year in the five stations. The energy density of the Ecuadorian hydropower dams is higher than Brazilian with similar capacity; this result is due to the Ecuadorian's geography. Despite benefits of the hydropower, to mitigate methane emission is recommended to minimize the environmental impact**.**

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~16:50

Venue: Pompadour-Meches

8 presentations- Topic: "Air Pollution Monitoring and Emission Reduction"

Session Chair 2: Prof. Khalil Hanna

D0028 Presentation 5 (15:50~16:05)

Carbon footprints in Ecuador: Case of Riobamba city ́s bus stations
M Córdova, D Cordova, F C Alvarez, M T Chaglla, P E Pico, **L V Pérez**
Technical University of Ambato. Av. Los Chasquis & Río Payamino, Ambato, Ecuador

Abstract—Analysis of carbon footprint and its environmental impact remains one of the most critical topics in air pollution research. Likewise, the effect of the transportation sector to emissions of air pollutants and greenhouse gases is a growing concern in developing countries, but, it is more complicated in undeveloped countries because of the lousy quality of fuels, exhaust technology and non-regulations of government control agencies. In the city of Riobamba, Ecuador, the growing population associated with the massive use of public transportation have all resulted in significant air pollution and greenhouse gas emissions. In this study, emissions were obtained with the Bacharach ECA 450 analyzer and used to calculate the emission factor of carbon dioxide and nitrogen oxide in kg/TJ. It was found that value of the emission factor of CO*2* was 57690, 13 kg CO_2/TJ. All Riobamba city bus stations contribute significantly to the carbon footprint. The factors that influenced the increase in the generation of greenhouse gases were: technology, the operation of buses and characteristics of fuel (diesel).

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~16:50

Venue: Pompadour-Meches

8 presentations- Topic: "Air Pollution Monitoring and Emission Reduction"

Session Chair 2: Prof. Khalil Hanna

D0032 Presentation 6 (16:05~16:20)

Carbon sink potential of *Avicennia marina* in the Al-Qurm nature reserve, Muscat, Oman
Abdullah Al-Nadabi and **Hameed Sulaiman**
Sultan Qaboos University, Muscat, Sultanate of Oman

Abstract—Climate change is a global issue, caused by increased levels of carbon dioxide in the atmosphere resulting in many adverse effects. One of the many responses to the climate change impact is to sequester carbon dioxide from the atmosphere. Al-Qurm Nature Reserve in Muscat city of Oman is a mangrove vegetation protected by law as conservation area. Carbon sequestration was estimated in three distinct zones of this natural mangrove vegetation with *Avicennia marina*. The mean carbon stock in the middle zone was 7.7±0.3 kg C/m^2, and for the seaward zone was 5.3±0.7 kg C/m^2, and for landward 18.8±0.1 kg C/m^2, which is 3.5 times higher than seaward zone and slightly more than 2 times than middle zone. The 0.82 km^2 of Al-Qurm Nature Reserve occupied purely by *Avicennia marina* was estimated to sink about 8692 t C (0.0087 Mt C) equivalent to about 0.032 Mt of $CO_{2e.}$ These estimates suggest a high carbon storage and carbon sequestration potential of *Avicennia marina* in Al-Qurm Nature Reserve despite their relatively small area.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~16:50

Venue: Pompadour-Meches

8 presentations- Topic: “Air Pollution Monitoring and Emission Reduction”

Session Chair 2: Prof. Khalil Hanna

D0021 Presentation 7 (16:20~16:35)

Developing a new activity pollution index for emissions quantitative assessment in projects construction phase: case study of an administrative building, Egypt

Islam Elmasoudi, Mona G. Ibrahim, Wael Elham Mahmod and Emad Elbeltagi
Egypt-Japan University of Science and Technology, Alexandria, Egypt

Abstract—Quantitative assessment of emissions related to construction projects should be performed during the planning phase of the projects. This is significant to spot the high values of pollution during the construction phase. In this study, a model is developed to estimate pollution resulting from Buildings construction activities. The model calculates the generated pollution for each activity involved in the project as a result of dust, gases and noise emissions. A new index is developed namely Activity Pollution Index (API) which expresses the amount of total pollution for each activity during the project construction phase. Also, the developed model is able to display the resulted total pollution distribution throughout the project life that corresponding to the planned scheduling. An actual case study in an administrative building construction in Egypt is selected to demonstrate the practical use of the proposed model. The results show that the peak and minimum values of total pollution were occurred during the excavation activity and the formwork erections and steel fixing of the second segment of the building with values of API equal to 69 and 2, respectively.

Afternoon, February 7, 2018 (Wednesday)

Time: 14:50~16:50

Venue: Pompadour-Meches

8 presentations- Topic: "Air Pollution Monitoring and Emission Reduction"

Session Chair 2: Prof. Khalil Hanna

D0099 Presentation 8 (16:35~16:50)

Politicization of Global Warming and Energy Restructuring in China
SHI Xiaojin,WU Jinxi and SUN Qi
Tsinghua University, Beijing, China

Abstract—Among the problems concerning climate environment, global warming is one of them drawing the highest attention all over the world. The basic assumption is that the concentration of carbon dioxide in the atmosphere is positively correlated with global temperature. Under the premise of assuming that the concentration of carbon dioxide provided by the nature is constant, carbon dioxide generated from human activities is the crime culprit of global warming. In fact, from the scientific research point of view, a high-degree consensus has not yet been reached in respect to the global warming issue. Since the end of 1980s, it has converted from undetermined statistical prediction in various aspects to certain definitive well-recognized international consensus and become an important factor in the international political game through all efforts of political powers. In recent years, China is devoted to adjust energy structure and playing the role as a big power in terms of emission reduction and limitation. As a result, the leadership in renewable energy sources is quietly transferred from US to China. The move allows China to take the moral high ground and intensify its strength and standing in global governance.

Session 3

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: "Chemical Engineering"

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

D0009 Presentation 1 (13:30~13:45)

Utilization of Na-bentonite to improve pH-buffering capacity of acid sulfate soils in natural gas transmission pipeline Rights-of-Way, Thailand

N. Chittamart, S. Tawornpruek, D. Ketrot, S. Aramrak, K. Chittanukul, R. Sattapun
Kasetsart University, Bangkok, Thailand

Abstract—Na-bentonite, non-hazardous material usually uses as a drilling mud in Horizontal Directional Drilling (HDD) technique. Its alkalinity may reduce severe acidic conditions of acid sulfate soils (ASS) in natural gas transmission pipeline Rights-of-Way in Thailand (RoW). This study focused on the effects of Na-bentonite on pH buffering capacity (pHBC) of ASS. Five major acid sulfate soils in RoW were collected and incubated with incremental amounts of 0.4 M $Ca(OH)_2$ and 0.4 M HCl to determine their pHBC. Hydroxyl equivalent alkalinity derived from pHBC curves was used to define the appropriate rate of Na-bentonite. The various soil:Na-bentonite ratios of 1:0.1, 1:0.15, 1:0.2, 1:0.3, 1:0.4, 1:0.5, 1:1 were prepared to examine their pH change. The results showed that active acid sulfate soils especially in subsoil had very high pHBC and Na-bentonite can increase soil pH to the optimal pH of 6.0, implying that Na-bentonite was beneficial for acid sulfate soils.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: "Chemical Engineering"

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

S0003 Presentation 2 (13:45~14:00)

Initial Solubility & Density Evaluation of Non-Aqueous System of Amino Acid Salts for CO2 Capture: Potassium Prolinate blended with Ethanol and Ethylene Glycol
Ghulam Murshid and Sahil Garg
Sultan Qaboos Univeristy, Oman

Abstract—Amine scrubbing is the state of the art technology for CO_2 capture, and solvent selection can significantly reduce the capital and energy cost of the process. Higher energy requirement for aqueous amine based CO_2 removal process is still a most important downside preventive its industrial deployment. Therefore, in this study, novel non-aqueous based amino acid salt system consisting of potassium prolinate, ethanol and ethylene glycol has been studied. This work presents initial CO_2 solubility study and important physical properties i.e. density of the studied solvent system. Previous work showed that non-aqueous system of potassium prolinate and ethanol has good absorption rates and requires lower energy for solvent regeneration. However, during regeneration, solvent loss issues were found due to lower boiling point of the ethanol. Therefore, ethylene glycol was added into current studied system for enhancing the overall boiling point of the system. The good initial CO_2 solubility and low density of studied solvent system offers several advantages as compared to conventional amine solutions.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: "Chemical Engineering"

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

D0026 Presentation 3 (14:00~14:15)

Spindly $BiFeO_3$ Nanoparticles for Photodegradation of Organic Pollutants Under a Compact Fluorescent Lamp

S M Lam, Z H Jaffari, J C Sin and A R Mohamed
Universiti Tunku Abdul Rahman, Jalan Universiti, Bandar Barat, 31900 Kampar, Perak, Malaysia

Abstract—Spindly bismuth ferrite oxide ($BiFeO_3$, BFO) nanoparticles were fabricated by $Bi(NO_3)_3$, $Fe(NO_3)_3$, NaOH and urea solutions at 125^{o}C. The BFO nanoparticles have a spindle-shaped of ~120 m in length and ~50 nm in width. Such nanoparticles could be used in the photocatalytic degradation of Malachite Green (MG) dye under irradiation by a 105 W compact fluorescent lamp. They were very stable and could be easily recovered by an applied magnetic field. There was an optimal photocatalyst amount of 1.0 g/L, at which the degradation efficiency of MG was improved to 72.6% under exposure of visible light for 240 min. The active hydroxyl (•OH) radicals formed during the photocatalytic process were tested using a photoluminescence–terephthalic acid (PL–TA) measurement, which were validate to be significantly affected by the photocatalyst amount. Other organic pollutants including phenol, bisphenol A and methylparaben could also be photodecomposed in the presence of similar conditions. These features demonstrated the BFO nanoparticles practical applications in environmental remediation.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: "Chemical Engineering"

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

D0027 Presentation 4 (14:15~14:30)

Photocatalytic degradation of organic pollutants using surfactant-free hydrothermally prepared flower-like BiOBr hierarchical structures under visible light irradiation

J C Sin, C A Lim and S M Lam
Universiti Tunku Abdul Rahman, Jalan Universiti, Bandar Barat, 31900 Kampar, Perak, Malaysia.

Abstract—Flower-like BiOBr hierarchical structures were successfully prepared via a facile hydrothermal route in the absence of any surfactants. Various characterization tests were carried out to analyze the as-prepared BiOBr samples. By utilizing the flower-like BiOBr as photocatalysts, enhanced photocatalytic performance on the sunset yellow degradation was observed in comparison with the BiOBr nanosheets and commercial TiO_2. The photocatalytic enhancement was ascribed to the unique hierarchical porous surface structure with good crystallinity and optical properties, which could improve the electron-hole pairs separation and led to high yield of reactive oxygen species for photocatalytic reaction. Other organic pollutants such as bisphenol A and methylparaben were also successfully degraded over flower-like BiOBr under similar experimental conditions.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: "Chemical Engineering"

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

D3011 Presentation 5 (14:30~14:45)

Effect of zinc oxide on adsorption property of iron oxide nanofibers for Congo red

Richard Appiah-Ntiamaoh, Bekelcha Tesfaye Gadisa, Hern Kim
Myongji University , Yongin, Gyeonggi-do 17085, Republic of Korea

Abstract—Congo red (CR) is one of the many highly toxic waste materials generated by the textile and other auxiliary industries. Methods to remove CR include: adsorption, bio-sorption, electrochemical reduction, membrane separation and photo-degradation. Amongst these methods, adsorption is preferred because of it low cost, high efficiency and ease of use. Consequentially, different types of CR adsorbents ranging from bio-based, inorganic-based, and composites have been reported. Amongst the inorganic adsorbents, iron oxide and its composites with polymeric materials have shown high efficiency for CR removal, especially those prepared as nanofibers (Nfs): the polymer matrix provides a high surface area for iron nanoparticles deposition leading to the exposure more adsorption sites, prevents aggregation, and allows easy separation. The positive charge on iron and the high porosity of the Nf are the driving forces for CR adsorption. Herein, we prepared Zn/Fe oxide-Nf by calcining electrospun PAN-Zn-Fe Nf and investigated it adsorption property for CR. The idea behind this study is simple: nano-sized iron oxide has a PZC at ~7.8 pH while that of ZnO is ~8.9 pH. Thus by adding ZnO to iron oxide-Nf, the magnitude of the net positive charge on resulting fiber will increase allowing it better adsorb CR over a wider pH range. Zeta-potential studies were done to confirm the change in the magnitude of surface charge with the addition of ZnO. The incorporation of ZnO also leads to the formation of ZnO/Fe2O3-Nf with corrugated-surfaces which exhibit high adsorption capacity. The different thermal properties of Fe2O3 and ZnO in the Nf generated different diffusion reactions which led to the formation of the corrugated-morphology. SEM and TGA analysis were used confirm this phenomenon. The as-synthesized ZnO/Fe2O3-Nf has an impressive qm value of 250mg/g. This combined with the ease of synthesis makes ZnO/Fe2O3-Nf an adsorbent with huge potential for extensive application.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: "Chemical Engineering"

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

S0001 Presentation 6 (14:45~15:00)

Application Study of Bio- FGD based on Environmental Safety during the Coal Combustion

Pin Zhang
Institute of Resource and Safety Engineering, China University of Mining and Technology Beijing , China

Abstract—Coal combustion produces a large amount of acidic gas, which is the main cause of acid rain and other natural disasters. Flue Gas Desulfurization (FGD) is a necessary requirement for clean coal combustion. Compared with the traditional chemical desulfurization technology, biological desulfurization has the advantages of low operating cost, without secondary pollution, low carbon emission and the additional economic benefits. The process and structure of BioDeSOx which as one of Bio-FGD technology is introduced. The major factors that influent BioDeSOx Bio- FGD system is the pH, oxidation reduction potential (- 300 MV to -400MV), electrical conductivity, the adding amount of nutrient and temperature (30℃-40℃). Taking the Bio- FGD project of Yixing xielian thermal power plant as an example, the BioDeSOx technology was applied in this project. The environmental and economic benefits of the project were greater than the traditional desulfurization technology. With the continuous improvement of environmental safety standards, Bio- FGD technology will have broad application prospects.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: "Chemical Engineering"

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

S0052 Presentation 7 (15:00~15:15)

Pyrolysis of polyethylene terephthalate containing real waste plastics using Ni loaded zeolite catalysts

Mohammed Abdulraheem Al-Asadi and **Norbert Miskolczi**
University of Pannonia, Hungary

Abstract—In this work the pyrolysis of polyethylene terephthalate (PET) containing real waste plastic was investigated using different Ni loaded catalysts: Ni/ZSM-5, Ni/y-zeolite, Ni/ -zeolite and Ni/natural zeolite (clinoptilolite). Raw materials were pyrolyzed in a horizontal tubular reactor between 600 and 900 ℃ using 10% of catalysts. It was found, that both temperature increasing and catalysts presence can increase the gas yields, however owing to gasification reactions, the pyrolysis oil yield decreased with increasing temperature. Ni/y-zeolite catalyst had the most benefit in gas yield increasing at low temperature; however Ni/ZSM-5 showed advanced property in gas yield increasing at high temperature. Gases contained hydrogen, carbon oxides and hydrocarbons, which composition was significantly affected by catalysts. Ni loaded zeolites favoured to the formation of hydrogen and branched hydrocarbons; furthermore the concentrations of both CO and CO2 were also increased as function of elevated temperature. That phenomenon was attributed to the further decomposition of PET, especially to the side chain scission reactions. Owing to the Boudouard reaction, the ratio of CO2/CO can increased with temperature. Pyrolysis oils were the mixtures of n-saturated, n-unsaturated, branched, oxygen free aromatics and oxygenated hydrocarbons. Temperature increasing has a significant effect to the aromatization and isomerization reactions, while the catalysts can efficiently decreased the concentration of oxygen containing compounds.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: “Chemical Engineering”

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

S0054 Presentation 8 (15:15~15:30)

Co-pyrolysis of biomass and plastic wastes: investigation of apparent kinetic parameters and stability of pyrolysis oils

Bahmed Fekhar, Norbert Miskolczi, Thallada Bhaskar, Jitendra Kumar and Vaibhav Dhyani
University of Pannonia, MOL Department of Hydrocarbon & Coal Processing, Hungary

Abstract—This work is dedicated to the co-pyrolysis of real waste high density polyethylene (HDPE) and biomass (rice straw) obtained from agriculture. Mixtures of raw materials were pyrolyzed in their 0%/100%, 30%/70%, 50%/50%, 70%/30%, 100%/0% ratios using a thermograph. The atmosphere was nitrogen, and a constant heating rate was used. Based on weight loss and DTG curves, the apparent reaction kinetic parameters (e.g., activation energy) were calculated using first-order kinetic approach and Arrhenius equation. It was found that decomposition of pure plastic has approximately 280 kJ/mol activation energy, while that of was considerably less in case of biomass. Furthermore, HDPE decomposition takes by one stage, while that of biomass was three stages. The larger amount of raw materials (100 g) were also pyrolyzed in the batch rig at 550 ℃ to obtain products for analysis focussing to their long-term application. Pyrolysis oils were investigated by Fourier transformed infrared spectroscopy and standardized methods, such as density, viscosity, boiling range determination. It was concluded, that higher plastic ratio in raw material had the advantageous effect to the pyrolysis oil long-term application. E.g., the concentration of oxygenated compounds, such as aldehydes, ketones, carboxylic acids or even phenol and its derivate could be significantly decreased, which had an advantageous effect to their corrosion property. Lower average molecular weight, viscosity, and density were measured as a function of plastic content.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: "Chemical Engineering"

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

S0069 Presentation 9 (15:30~15:45)

Study of doping effects with 3d and 4d-transition metals on the hydrogen storage properties of MgH_2

M. El Khatabi, M. Bhihi, S. Naji, H. Labrim, A. Benyoussef, A. El Kenz, M. Loulidi
Faculty of science, University Mohammed V., Morocco

Abstract—A DFT study is performed to understand the underlying mechanisms behind the improvement of hydrogen storage properties of MgH2 doped with different transition metals TM= Sc, Ti, V, Cr, Y, Zr, Nb, Mo. These TMs are either from the same period or the same group of the periodic table. Our calculations are performed using all-electron full-potential local-orbital minimum-basis scheme (FPLO9.00-34) within the generalized gradient approximation. Based on our results, we observe a reduction of the heat of formation ΔH and also of the desorption temperature Td which reflect the improvement of hydrogen storage properties of most TMs doped MgH2 systems. In particular, Nb appears to be the best substitution, with an ideal heat of formation that equals to -40.96 kJ/mol, and a desorption temperature Td=313.40K. Our findings demonstrated that, the decrease of ΔH and Td is, mainly, related to the weakening of the bond between Mg and H. A detailed study of the effect of each TM on the stability of MgH2 was carried on. Our discussion was based on the charge transfer between the system elements, the difference of electronegativity, and finally the density of states.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Montaigut to Haies

10 presentations- Topic: “Chemical Engineering”

Session Chair 3: Prof. Susan Richardson & Prof. Jinho Bae

S0079 Presentation 10 (15:45~16:00)

Demineralization study of high ash Indian coal by chemical leaching techniques
Sushanta Kumar Behera, S. Chakraborty, B. C. Meikap
Department of Chemical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

Abstract—Indian coals are drift origin and these are mostly low-grade coals (LGCs). The LGCs are associated with excess mineral matter, moisture content and have less heating value. The LGCs or high ash coals are not only reducing the thermal value of coal but also leads to the generation of solids and gaseous pollutants, which is a major environmental problem. Chemical cleaning techniques is an effective to reduce both organic and inorganic minerals. Hence, this study investigates the effect of chemical treatment on coal composition, deashing of coal, and functional groups of the low-grade coals. Low-grade is important to for the energy demand as well as economic development for the industries. Chemical cleaning techniques is an efficient method for to remove the organic and inorganic minerals without affecting the carbon content of coal. A method was devised for the removal of deleterious minerals and trace elements from the low-grade coals. An attempt has been made in this investigation to study the effect of leaching concentration and dissolution major minerals constituent (especially silica and alumina) from low-grade coal was studied. The low-grade coal was selected from Mahanadi Coalfield of Odisha, India. The coal sample (-72 mesh size) was treated with 10 to 40 by wt% of caustic concentration at 60 ℃ to 120 ℃ for 2 h. The investigation results showed that the degree of demineralization was improved with increase concentration; which reduces the ash content adequately by the effect of caustic leaching. Apart the leaching study, the mechanism of demineralization and the characterization was evaluated from the X- ray diffraction (XRD) analysis and X-ray fluorescence (XRF) spectrometer.

Coffee Break Time	**15:45~16:15**

Session 4

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: "Resources and Environmental Management"

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D0018 Presentation 1 (13:30~13:45)

Influence of Coastal Measures on Shoreline Kinematics Along Damietta coast Using Geospatial Tools

Mohammed Esmail, Wael Mahmod and Hassan Fath
Egypt-Japan University of Science and Technology, Alexandria, Egypt

Abstract—The shoreline trajectory of Damietta city, located at the Northern coast of Egypt, is dramatically subjected to significant kinematic changes. Several types of coastal measures have been applied substantially along the coastal stretch of Damietta to protect shoreline (detached breakwaters, Jetties, groins, and seawalls). This study focuses in the assessment of shoreline kinematics response due to the existence of these structures during the period from 1990 to 2015 using satellite images and geo-spatial tools. Three semi-automatic extraction techniques are initially tempted for Landsat ETM 2003 imagery namely; Iso cluster technique, threshold method, and onscreen digitizing. The shoreline variation measurement of is described for three sectors based on the allocation of the coastal measures:(1) the western sector encompassing Damietta port with two jetties; (2) the central sector including detached breakwaters; (3) the eastern portion of Damietta estuary passing through a seawall. The results show that, the shoreline has progressed by +10.0 m/year rate west of Damietta port. Behind the detached breakwaters, the shoreline has advanced by +12.0 m/year from 1999 to 2003 and then has decreased gradually to be near the stable state in 2015. The highly eroded by average rate of -78 m/year appeared at end of eastern seawall.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: "Resources and Environmental Management"

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D0084 Presentation 2 (13:45~14:00)

Species diversity, biomass, and carbon stock assessments of mangrove forest in Labuhan, Indonesia

M A Asadi, D Yona and S E Saputro
University of Brawijaya, Malang, East Java, Indonesia

Abstract—Mangroves provide numerous ecosystem services, including fisheries production, nutrient cycling, soil formation and carbon storage. However, the forests and their habitat have degraded rapidly due to anthropogenic threats. Consequently, the loss of carbon (C) stored in these ecosystem is inevitable. The purpose of this study was to evaluate the species diversity of mangrove forest of Labuhan, Lamongan regency, Indonesia and evaluate its above-ground and below-ground-root biomass and C. Twenty-four plots with a size of 10x10 m were carried out using the quadrat sampling technique to identify, record and measure the DBH of the trees. The Shannon –Wiener's diversity index (H'=1.51*)* was moderate, having a total of nine true mangrove forests dominated by *Rhizophora mucronata* and *Rhizophora apiculata* with an importance value index of 100.40% and 80.46% respectively. The total C stored in above-ground and below-ground-root was 74.70 ± 15.58 Mg C ha^{-1}, which is equivalent to total CO_2 sequestration of 274.15 ± 57.18 Mg CO_2 ha^{-1}. This study suggests that the Labuhan mangrove forest has a potential to store and sequester a substantial amount of atmospheric C; therefore, it is needed to protect and sustainably manage this important forest.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: "Resources and Environmental Management"

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D0033 Presentation 3 (14:00~14:15)

"Rio Preto Urgente": a proposal for conservation and recovery

R de M Teles, A da P Rocha, G R do Vale, L V S Pinheiro, M R Magalhães and C A Leão
Instituto Federal de Educação Ciência e Tecnologia do Maranhão, Monte Castelo, Maranhão, Brazil

Abstract—The Association of Young People of Alto Rio Preto (JUAP) and the Association of Children and Friends of São Benedito, Maranhão, Brasil (AFASB) develop the "Avante Camaradas" (Forward Comrades) Project and the "Alonga Vida" (Lenghten Life) Operation, for the maintenance of the Preto River and the Mocambo River, its main tributary. From these actions arose the necessity of technical study of the Preto River. In this research we carried out expeditions in the river, we verified its bed, tributaries, vegetation, number of households and riverside. The study area was from Tutanguira village to ETA CAEMA (Water Treatment Station of the Environmental Sanitation Company of Maranhão). Flora, with identification of 89 species and fauna, with identification of 101 bird species, 28 species of herpetofauna (amphibian and reptiles) and 11 species of mammals were studied. Environmental impacts such as cutting and burning vegetation, extraction of wood for sawmill, coal and fishing, sand extraction and pebble stone are frequent in the river area. A socioeconomic diagnosis of the community of the study area was made, being verified that the majority is farmer and with low schooling. The river runs the risk of being no longer perennial and becoming intermittent due to the degradation caused by population growth and the monoculture of soybean and eucalyptus. One suggests the execution of an urgent maintenance and recovery project in the Preto River.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: "Resources and Environmental Management"

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D0092 Presentation 4 (14:15~14:30)

Preliminary analysis of surface circulation off the Minjiang River Estuary near the southwestern East China Sea

Hsien-Wen Chen
Central Police University, Taoyuan, Taiwan

Abstract—Better understanding the surface circulation in the marine environment is pertinent to the preparedness of pollution response and maritime safety. In the spring of 2012, two GPS surface drifters were deployed off the Minjiang River Estuary to study the surface circulation near the southwestern East China Sea. One drifter followed the China Coastal Current and the other one joined the Taiwan Warm Current. Classical harmonic analysis technique was employed to analyse the current velocities derive from the trajectories of these two drifters. M2 tidal component is dominant in the tidal current spectrum. The residual currents obtained from these 2 drifters agree very well with the previous studies.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: "Resources and Environmental Management"

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D0036 Presentation 5 (14:30~14:45)

Prediction of optimal C: N ratio in different palm oil mill waste mixtures and its evaluation of earthworm biomass

P F Rupani, A Embrandiri, A F M Alkarkhi, M H Ibrahim and M Abbaspour
Islamic Azad University, Tehran, Iran

Abstract—The oil palm industry has been recognized for its contribution towards economic growth and rapid development, it has also contributed to environmental pollution due to the production of huge quantities of by-products from the oil extraction process**.** Current research reports prediction of optimal CN ratio of different mixture percentages of palm oil mill effluent (POME) and palm pressed fiber (PPF) namely 100% (only POME), 90%, 80%, 70%, 60%, 50%, 40%, 30%, 20%, 10% and 0% (only PPF). Different mixture percentages with varying initial characters results in different C:N ratio which could affect the earthworm growth and the vermicomposting stability. Therefore, the present research aims to predict the optimal mixture by establishing a 3D base model. The models were generated having an average unified formula using mathematical software Matlab. The results obtained in this study indicates that the 3D polynomial graph can explain the relationship between different POME-PPF concentration with respect to earthworm growth and time showing ideal R^2 value of 0.99. The regression analysis showed positive correlation between different mixture percentages and earthworm growth in 50% (r = 0.412), 60% (r = 0.509) and 70% (r = 0.441). Therefore, from the model it can conclude that 60% mixture of POME-PPF is an optimal mixture for the vermicomposting process.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: “Resources and Environmental Management”

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D0034 Presentation 6 (14:45~15:00)

Road Traffic Noise Forecast (RTNF) in the process of creating urban space - case study of Poland

K Szopińska
UTP University of Science and Technology, Poland

Abstract—Road traffic noise is one of the main nuisance factors in a city. This creates the necessity of determining and monitoring not only its level in relation to the existing urban structure, but also precisely determining and monitoring the level of noise over time, accounting for the designed spatial and functional solutions. In Poland, issues connected with noise are taken on in ecophysiographic reports and forecasts of its impact on the environment, which are a component of the local spatial development plan (LSDP) creation processes. Unfortunately, studies carried out on the noise environment are done in a selective manner, while environmental reports assume the consistency of nuisance phenomena over time. In connection with the above, the present article focuses on the problem of noise nuisance derived from a planned road solution while making a planning decision in the process of creating an LSDP. The specific aim is to present an original Road Traffic Noise Forecast (RTNF) understood as an element of the procedure of choosing an optimal spatial and functional solution for noise sensitive areas in terms of maintaining noise-level standards. The above will be illustrated on the example of a selected LSDP of the Polish city of Bydgoszcz.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: "Resources and Environmental Management"

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D0029 Presentation 8 (15:15~15:30)

Selective Isolation and Phenotypic Characterization of Bacteria and Actinomycetes From Oil-contaminated Soils

C A Rodríguez, T C Gavilánez, J P Chamorro, A G Vinueza, D M Salazar and M Y Arancibia
Technical University of Ambato. Av. Los Chasquis & Río Payamino, Ambato, Ecuador

Abstract—Large numbers of bacteria and actinomycete strains were isolated from two contaminated soils with high total petroleum hydrocarbons (TPH) content. From five selective media formulations used, nutrient agar and glucose yeast extract agar showed the best results. Bacterial colony forming units per dry gram soil (ufc/g) ranged from $5.14x10^3$ to $4.20x10^{11}$, whereas for actinomycetes was from $8.99x10^4$ to $9.2x10^7$ ufc/g. Seventy-three bacteria and ninety-three actinomycete isolates were recovered from the two soils. Numerical taxonomy analysis of phenotypic data shows that at 90% similarity, the bacteria could be divided into sixteen multimembered and fifteen single-membered phenetic-groups, while the actinomycetes were separated in twenty multimembered and four single-membered phenetic-groups. Out of the one hundred and sixty-six strains, only ten were unable to use gasoline or oil as sole carbon and nitrogen sources. Most of the isolates could degrade both hydrocarbons. The results of this study show that bacteria and actinomycetes are present in large numbers in high TPH contaminated soils, with an extraordinary degree of diversity and that they can use oil or its derivatives as nutrients.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: "Resources and Environmental Management"

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D0068 Presentation 9 (15:30~15:45)

Antimicrobial potential of *Chlorella* algae isolated from stacked waters of the Andean Region of Ecuador

L P Acurio, **D M Salazar**, A F Valencia, D R Robalino, A C Barona, F C Alvarez, C A Rodriguez
Technical University of Ambato. Av. Los Chasquis & Río Payamino, Ambato, Ecuador

Abstract—In this study, the focus will be primarily on antimicrobials extracted from Microalgae *Chlorella* from stacked water from three different places. The results provide dates for possible applications in the pharmaceutical industry for developing antiseptic and antimicrobial products to guarantee the health of the people. The study initially outlines the isolation of microalgae and secondly was the extraction of chlorellin as an antimicrobial metabolite. To replicate the environmental conditions which are useful for growth colonies of *Chlorella* it was maintained at room temperature, oscillating between 10 ℃ to 18 ℃ in Bold Basal medium enriched with NH4Cl. After that, chlorellin was extracted from aqueous supernatant and sediment with ethanol, isopropyl alcohol, and water. The results of this study show that the chlorellin extracted from *Chlorella* present an essential antimicrobial capacity against bacteria isolated from the hand. The antimicrobial capacity was equal with ampicillin and oxacillin to inhibit *Staphylococcus spp.*

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~16:00

Venue: Meches to Pompadour

10 presentations- Topic: "Resources and Environmental Management"

Session Chair 4: Prof. Khalil Hanna & Prof. Rogério Teles

D1003 Presentation 10 (15:45~16:00)

Comparator design in sensors for environmental monitoring
Jingtao Li, **Hua Fan**, Yuhan Wu, Quanyuan Feng,
Dagang Li, Daqian Hu, Yuanjun Cen, and Hadi Heidari
University of Electronic Science and Technology of China, Chengdu, China

Abstract—This paper presents circuit design considerations of comparator in analog-to-digital converters (ADC) applied for a portable, low-cost and high performance nano-sensor chip which can be applied to detect the airborne magnetite pollution nano particulate matter (PM) for environmental monitoring. High-resolution ADC plays a vital important role in high performance nano-sensor, while high-resolution comparator is a key component in ADC. In this work, some important design issues related to comparators in analog-to-digital converters (ADCs) are discussed, simulation results show that the resolution of the comparator proposed can achieve 5 V, and it is appropriate for high-resolution application.

Coffee Break Time	**15:45~16:15**

Session 5

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: "Renewable Energy Generation and Assessment"

Session Chair 5: Prof. Yun Seng Lim

S0031 Presentation 1 (13:30~13:45)

Intelligent Prediction Model for Run-of-River Flow Considering Electricity Extreme Conditions

Raju Rai and Ken Nagasaka
Tokyo University of Agriculture and Technology, Japan

Abstract—The Artificial neural networks (ANNs) is becoming a common analysis of hydrology and water resources development, management, modeling and prediction systems. Nepal is a developing country with rich in water resources, the electricity demand is very high but generation is very low. The river flow rate plays an increasingly important role in electricity generation in Nepal. To reduce the power shortage in a local community, prediction of river flow is most necessary for the Run-of-River hydropower plants in Nepal. In this research, the river flow forecasting model based on the Artificial Neural Networks (ANNs) was developed using the Neural Connection. The performance of the developed model based on the results of this research, prediction of river flow was observed. One week of flow prediction test was conducted and one week ahead of its hydropower generation potential was identified. Employing Radial Basis Function Network (RBFN) method for forecasting of river flow and observed less than 8% of error of test data for one week. It has been analyzed that river flow rate prediction helps to reduce the demand for electric power and generation of hydropower plants. The prediction method optimizes and plan for the future system. The paper analyzes the river flow prediction and technical potential of electricity generation of the hydropower plant.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: "Renewable Energy Generation and Assessment"

Session Chair 5: Prof. Yun Seng Lim

S0041 Presentation 2 (13:45~14:00)

Performance Degradation of Photovoltaic Modules at Different Sites
A Hadj Arab, I Hadj Mahammed, S Ould Amrouche, B. Taghezouit and N. Yassaa
Centre de Développement des Energies Renouvelables, CDER, 16340, Algiers

Abstract—In this work are presented results of electrical performance measurements of 120 crystalline silicon PV modules following long-term outdoor measurements. A set of 90 PV modules represent the first grid-connected photovoltaic (PV) system in Algeria, installed at the level of the "Centre de Développement des Energies Renouvelables" (CDER) site (Mediterranean coast), Bouzareah. The other 30 PV modules were undertaken in an arid area of the desert region of Ghardaïa site, about 600 km south of Algiers, with measurements collected from different applications. Following different characterization tests, we noticed that the all tested PV modules kept their power-generating rate except a slight reduction. Therefore, a mathematical model has been used to carry out PV module testing at different irradiance and temperature levels. Hence, different PV module parameters have been calculated from the recorded values of the open-circuit voltage, the short-circuit current, the voltage and current at maximum power point. The electrical measurements have indicated different degradations of current-voltage parameters. All the PV modules stated a decrease in the nominal power, which is variable from one module to another.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: "Renewable Energy Generation and Assessment"

Session Chair 5: Prof. Yun Seng Lim

S0048 Presentation 3 (14:00~14:15)

Using Particle Swarm Optimization to enhance PI Controller performances for Active and Reactive Power Control in Wind Energy Conversion Systems

M Taleb, M Cherkaoui and M Hbib
Mohamed V University, EMI, Rabat, Morocco

Abstract—Recently, renewable energy sources are impacting seriously power quality of the grids in term of frequency and voltage stability, due to their intermittence and less forecasting accuracy. Among these sources, wind energy conversion systems (WECS) received a great interest and especially the configuration with Doubly Fed Induction Generator. However, WECS strongly nonlinear, are making their control not easy by classical approaches such as a PI. In this paper, we continue deepen study of PI controller used in active and reactive power control of this kind of WECS. Particle Swarm Optimization (PSO) is suggested to improve its dynamic performances and its robustness against parameters variations. This work highlights the performances of PSO optimized PI control against classical PI tuned with poles compensation strategy. Simulations are carried out on MATLAB-SIMULINK software.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: "Renewable Energy Generation and Assessment"

Session Chair 5: Prof. Yun Seng Lim

S0053 Presentation 4 (14:15~14:30)

Maximum Power Point Tracking Techniques for Wind Energy Systems using Three Level Boost Converter

Cuong Hung Tran, Nollet Frédéric, Najib Essounbouli and Abdelaziz Hamzaoui
CReSTIC - University of Reims Champagne-Ardenne – France

Abstract—This paper presents modeling and simulation of three level Boost DC-DC converter in Wind Energy Conversion System (WECS). Three-level Boost converter has significant advantage compared to conventional Boost. A maximum power point tracking (MPPT) method for a variable speed wind turbine using permanent magnet synchronous generator (PMSG) is also presented. Simulation of three-level Boost converter topology with Perturb and Observe algorithm and Fuzzy Logic Control is implemented in MATLAB/SIMULINK. Results of this simulation show that the system with MPPT using fuzzy logic controller has better performance to the Perturb and Observe algorithm: fast response under changing conditions and small oscillation.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: "Renewable Energy Generation and Assessment"

Session Chair 5: Prof. Yun Seng Lim

S0049 Presentation 5 (14:30~14:45)

Grid-Style Modular Network Self-Organization Map for Detail Projection of Unknown Off-shore Wind Speed

Mitsuharu Hayashi and Ken Nagasaka
Tokyo University of Agriculture and Technology, Japan

Abstract—Wind generation is one of the fast growing and introduced resources among renewable energies through worldwide including Japan. As Japan, on the other hand, is an island country surrounded by ocean, the landscape topography suitable for wind generation is limited for the on-shore. Therefore, based on the wind map of up to year 2030, it is expected that new wind generation installation will be more suitable on off-shore rather than on-shore. For this reason, it is very important to determine the wind characteristics of the candidate area for installing wind generation, however in most cases of off-shore installation, existence of weather condition data is poor and needs lots of time and cost for measuring pin-point weather condition data. In this study, the goal of this research is to project a wind speed of an unseen area (where its weather condition data is not available) by mapping the seen areas (where their weather condition data are available) around the target area using the modularized Artificial Neural Network (SOM: Self-Organization Map). By learning the correlation between modularized ANNs of seen and unseen areas, the result of this temporal and spatial projection will be the prediction of wind speed of target place. Furthermore, in this study, by segmenting the area as grid-style and learning it, it becomes possible to predict the wind speed more detail and more precise. It is believed, by the help of the proposed technique, a huge amount of time and cost will be saved for selection of off-shore installation point of off-shore wind power generation. Moreover, it will certainly contribute to the development and speed-up of off-shore wind power generation in the future.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: "Renewable Energy Generation and Assessment"

Session Chair 5: Prof. Yun Seng Lim

S0078 Presentation 6 (14:45~15:00)

GIS-based approach for the evaluation of offshore wind power potential for Gujarat
D Patel, G Nagababu, M Sheth, N Sheth, N Radadia and S Parsana
Pandit Deendayal Petroleum University, Gujarat, India

Abstract—In the current global scenario, India is increasing its focus towards the methods to enrich the benefits of non-renewable energy sources as much as possible due to their key advantage of having low carbon footprint. India has already emerged as a key global player in on-shore wind energy and to achieve its annual wind energy production demand of 50 GWh, avenues other than current options have been researched on. Offshore wind energy has experienced remarkable growth worldwide but has not yet been harnessed sufficiently in India, despite addressing many of environmental and economic concerns. The present study focuses on offshore wind resource assessment on Indian exclusive economic zone (EEZ) around Gujarat region. The geographical information system (GIS) methodology has been used to develop maps of wind speed, power density and capacity factor maps. Further, careful consideration has been accorded for expulsion of marine protected areas, shipping transportation lines, fishing zones, and migratory bird movements. The resultant available area has been considered for annual energy production considering data from Siemens Wind Turbine 3.6. The results obtained shows that offshore wind energy can offset twice the annual energy demand of entire country with a potential energy production of more than 2580 TWh.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: "Renewable Energy Generation and Assessment"

Session Chair 5: Prof. Yun Seng Lim

S0051 Presentation 7 (15:00~15:15)

Promotion of renewable energy in some MENA region countries
K. Abdeladim, S. Bouchakour, A. Hadj Arab, S. Ould Amrouche, N. Yassaa
Centre de Développement des Energies Renouvelables, CDER, Algeria

Abstract—In recent years Middle East and North African (MENA) countries, are showing efforts about the integration of renewable electricity into their power markets. Indeed, installations were already achieved and renewable energy programs were launched. The Algerian program remains one of the most ambitious with its installation capacity up to 22GW of power generating to be installed by 2030. More than 60 % of the total capacity is planned to be solar photovoltaic (PV). Like Algeria, Morocco has integrated development project with a target to develop by 2020 a 2000 MW capacity of electricity production from solar energy. The Tunisian government has launched its first phase of the renewable power generation program, with an objective to install 1,000 MW of renewable power capacity over the 2017-2020 periods, where 650 MW of the total capacity is planned to be solar and 350 MW wind. One of the leading Arab country in wind energy, these recent years is Egypt, with its more than 700 megawatt of operational power generation plants and has launched significant projects development in solar energy. Regarding Jordan, the government has taken different steps in this field of energy with a Strategy plan 2007-2020, by implementing a large scale of projects on renewable energy sources, with an objective to cover 10% of the country's energy supply, from renewable sources by the year 2020. Concerning Lebanon, the country is looking to attain an integration of 12 % by 2020.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: “Renewable Energy Generation and Assessment”

Session Chair 5: Prof. Yun Seng Lim

S0028 Presentation 8 (15:15~15:30)

Climate Conditions of the “El Niño” Phenomenon for a hydro-eolic complementarity project in Peru

Leonardo Castillo N, Arturo Ortega M and Jaime E Luyo
Civil Engineering, National University of Engineering, Lima-Peru

Abstract- Northern Peru is threatened by the consequences of a natural phenomenon called “El Niño”, mainly during the months of December to April. In the summer of 2017, this event reported strong climatic variations with intense rains, increasing the water levels of the Chira and Piura rivers, filling the Poechos reservoir, together with flooding and mudding. However, from an energetic perspective, these climatic alterations have a strong potential to increase the availability of the wind and hydro renewable energies in northern Peru. This work performs an evaluation of the hydro-eolic complementarity as part of the sustainability of energy systems. The study includes evaluation of historical records of wind velocity and water flow rates. It then evaluates correlation, analysis, and estimates the hydro and wind energy potentials generated by this phenomenon. The implications of the "El Niño" phenomenon are mostly negative. Nonetheless, it is possible to take advantage of higher wind and water flow rates with a hybrid energy system. The results obtained show a high degree of complementarity both normal and "El Niño" phenomenon condition in northern Peru.

Afternoon, February 8, 2018 (Thursday)

Time: 13:30~15:45

Venue: Palais + Breches

9 presentations- Topic: "Renewable Energy Generation and Assessment"

Session Chair 5: Prof. Yun Seng Lim

S0085 Presentation 9 (15:30~15:45)

The impact of predicted demand on energy production
Ismail El kafazi, R. Bannari, My. O. Aboutafail
Laboratory Systems Engineering, Ensa, Ibn Tofail University Kenitra, Morocco

Abstract—Energy is crucial for human life, a secure and accessible supply of power is essential for the sustainability of societies. Economic development and demographic progression increase energy demand, prompting countries to conduct research and studies on energy demand and production. Although, increasing in energy demand in the future requires a correct determination of the amount of energy supplied. Our article studies the impact of demand on energy production to find the relationship between the two latter and managing properly the production between the different energy sources. Historical data of demand and energy production since 2000 are used. The data are processed by the regression model to study the impact of demand on production. The obtained results indicate that demand has a positive and significant impact on production (high impact). Production is also increasing but at a slower pace. In this work, Morocco is considered as a case study.

Coffee Break Time	**15:45~16:15**

Session 6

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:45

Venue: Montaigut to Haies

10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

D0013 Presentation 1 (16:15~16:30)

Ruralization vs. urbanization sprawl as guiding regional planning: development scenario for rivers watershed in the southern Syrian coastal region

T Rahmoun, W Zhao, M Hammad, M Hassan
Tishreen University, Latakia, Syria

Abstract—This study aimed at opening discussions concerning new ideas of suggesting sustainable scenario based on the principle of an integrated spatial development ring between urban-rural areas along and between AL-Abrash and AL- Hseen rivers watershed, as an application of the bottom-up planning model, seeking to achieve ruralization in parallel with urbanization. This paper adopted data collections and analysis through using a step-by-step approach. Firstly, investigated the land-cover change (LCC) during 30-years. Therefore, using multi-temporal satellite data from different dates for the same study area to create thematic land cover maps which can be used for land cover change detection. Three Landsat satellite images from1987, 2002 and 2017 were classified separately using the supervised classification method in ArcGIS, to provide an economical way to quantify, map and analyse changes over time in land cover. Then, SWOT analysis for the possibilities and determinants within the two-way flow of the current and futuristic economic activity, besides discussion the opportunities of the land-use (LU) taking into account slop map to achieve conservation priority for natural resources. Finally, evaluate results and establishing a sustainable spatial scenario approachable to upgrade into scaling up/out to covering the coastal region watersheds, can support regional planning and decision-making in the future.

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Venue: Montaigut to Haies

10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

D0073 Presentation 2 (16:30~16:45)

Effect of Aspect Ratio and Symmetrical Distribution on Urban Design in Baghdad City, and the Impact of Greenery Strategies on improving Outdoor Thermal Comfort

Suaad RIDHA
Al-Mustansiriyah University, College of Engineering, Iraq-Baghdad

Abstract—The concept of outdoor thermal comfort depends on the perception and content of the pedestrians, especially in hot and arid climates. Consequently, this research concentrates on the appropriate methods to improve the pedestrian outdoor thermal comfort. There is limited research conducted on the outdoor thermal comfort in an arid climate. The studies on enhancing outdoor thermal comfort are almost non-existent for places like Baghdad city. Baghdad has a sophisticated urban fabric with modern design buildings, traditional houses. This work focuses on investigating possible mitigation strategies to determine how pedestrian comfort is affected by the constructions design choices and how vegetation contributes to improving the outdoor thermal comfort. The evaluation was performed by using ENVI-met on the hottest day in summer. ENVI-met represents three-dimensional buildings and calculates the effect of the vegetation and its relation to the outdoor thermal comfort. We adopted PMV indices to evaluate the outdoor thermal comfort. This work aims to design cities in a hot, arid climate and to maintain an appropriate level of outdoor thermal comfort. Also, how to achieve a proper climate for pedestrians during the daytime under the blazing sun, especially in cities with an excessive rise in summer temperatures and for several months, as in Baghdad. The research presents a proposal district design in an arid climate based on the architectural and implementation criteria to improve the pedestrians thermal comfort conditions and how the urban factors such as the aspect ratio, symmetrical distribution, and the green strategies are essential elements that urban planners may be taken into account, especially for design new urban area in an arid climate.

Afternoon, February 8, 2018 (Thursday)

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Venue: Montaigut to Haies

10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

S2001 Presentation 3 (16:45~17:00)

Illumination of the Marmaray Project
C Perdahci, **D Yuce** and R. A. Aynaci
Litpa Lighting, Istanbul, Turkey

Abstract—The main objective of the underground railway stations lighting is to provide safe and comfortable conditions. This paper focuses on the illumination of Marmaray Project in order to shed light on long underground tunnel lighting design requirements and special railway tunnel environment. Moreover lighting of each Marmaray station and ticket hall were presented.

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10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

D0030 Presentation 4 (17:00~17:15)

An Analysis of Tourist Participation Restoration-Ecotourism through Systems Thinking
S R Kim and S D Lee
Ewha Womans University, Seoul, Republic of Korea

Abstract—The purpose of this paper is to suggest a new form of Ecotourism, Tourist Participation Restoration-Ecotourism, based on the system thinking perspective using causal loop analysis. Analysis target area is Dadaepo which is not only ecologically important place but also famous tourist site. Three causal loop diagrams are developed, and a mutuality among variables are found. From these, variables that management harmful effects are elicited. The results are as follows. Release some marine seedlings with tourists and reduce the damaging of environment. The obstacle of ecological tours is the disruption of ecosystem. Give an education to the tourists about the environment in advance and limit the number of seedling that is released through the quiz, thereby preventing secondary damage to the ecosystem. Managing the decline of biodiversity is a establishment of standards. If the diversity falls below the standard, prevent the release of seedlings for maintain the biodiversity. This can be care for ecosystem of tourist site and satisfy the needs of tourists. The conclusion provides some research implications and future research direction

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10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

D0022 Presentation 5 (17:15~17:30)

The Xique-Xique Network towards sustainability and solidarity
M Dantas and G Silva
Concordia University, Montreal, QC, Canada

Abstract—The industrialized food system holds considerable power over some of the most important aspects of our societies, such as health, environment, economy, culture and politics, though their main focus is private profit. In response to issues related to the production and distribution of goods alternative initiatives are emerging all over the world related to the creation of a food systems that promotes solidarity, diversity, democracy. This paper looked at an organization emerged from a group of women members of the Landless Movement called Rede Xique-Xique. The study presents data from a recent interview conducted with a community organizer involved with the Network, also includes records from previous unpublished research, consisting of a participant observation conducted in 2011. The study found that the network organization brought improvements to the living conditions of farmers and voice to a rather invisible portion of the population.

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10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

D3009 Presentation 6 (17:30~17:45)

Fermented Selected Plants Species as Organic Pesticides: Climate Change and Agriculture Combat

GM Binag
Guiyang No. 1 High School-Sino-Canadian Program, International Department, Guiyang,Guizhou China

Abstract—Agriculture is a major contributor to climate change. According to the International Panel on Climate Change, it accounts for up to 12% of all man-made greenhouse gas emissions. Thus, the research innovated how to consumed waste from different plant species in making an organic pesticide. Fermented seaweed (*Eucheuma denticulatum*), onion (*Allium cepa*), Garlic (*Allium sativum l.*), chili (*Capsicum frutescenes*), papaya (*Carica papaya*), jackfruit (*Artocarpus hyterophyluss Lam*), and kakawate, (*Gliricidia sepuim*), tobacco (*Nicotiana tobacum*), Snake Plant and ginger (*Zambinger officinale*) in coconut wine has potential in killing the rice black bug in an environmental friendly way. The fermented organic pesticides helped the small farmers to kill rice black bug without using a chemical that is hazardous to human's health and combating the climate change through agricultural practices. Besides, the fermented plants' species as a pesticide is more affordable and effective. Based on the result, there is a significant difference in the number of rice black bug killed among the different experimental treatments and time of exposures. It implies that significant difference between the fermented selected plant species and the commercial pesticide in terms of the number rice black bug killed and lastly there is a significant difference in the number of rice black bug killed at the different time of exposures. Thus, the researcher concluded that the fermented plants are proven effective and efficient and it will increase sustainability, because of the prevailing public opinion that natural products are uniformly safer, and thus more environmentally friendly, than synthetic chemicals.

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10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

D0069 Presentation 7 (17:45~18:00)

On the relationship between Lean practices and environmental performance

M Dieste and R Panizzolo
Engineering, University of Padua, Stradella San Nicola 3, 36100 Vicenza, Italy

Abstract—Lean production has emerged in the past decades as one of the most popular topics in business and manufacturing literature and it is the most extended production paradigm currently applied in industry. Lean production is characterized by five principles (value, map the value stream, flow, pull and continuous improvement) and by the importance of reducing waste (*muda*). Alongside the lean philosophy, the so-called green strategy has also gained importance in competition between firms. Many companies are trying to develop products that reduce environmental impacts throughout their life cycle. The aim is to reduce resource consumption, to replace hazardous substances, to increase recyclability, to enhance energy efficiency and to bring down CO_2 emissions. Lean and Green production paradigms are both focused on waste reduction and several authors have studied the relationship between Lean and Green practices and the synergic effects of joining these two management approaches. This research carries out a literature review in order to investigate if firms which have applied Lean principles and methods have improved their environmental measures. In particular, the work seeks to highlight which green indicators are more positively affected by Lean practices adoption. The results are synthesized in a final chart which illustrates the main green indicators cited in the literature and shows how these indicators have changed after a Lean transformation program. The research is to be understood as a work in progress and is part of a larger study that the authors are conducting on this topic.

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10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

D0040 Presentation 8 (18:00~18:15)

The Effects of Canopy Cover to Interception Loss at Tropical Forest

Azinoor Azida Binti Abu Bakar
UNIVERSITI TEKNOLOGI MARA PASIR GUDANG, Malaysia

Abstract—An interception study to investigate the effects of canopy cover of tropical forest was carried out in Bukit Lagong Reserved Forest. A 12-months data were collected during this study with 94 rainfall event were recorded. Two plots, namely Plot11 and Plot12, of 20m x 20m each were established to measure the distribution of interception (gross rainfall, Pg, throughfall, Tf and stemflow, Sf) and identify the percentage of forest canopy cover over the plotted area. Hemispherical photography method using fisheye lens was applied to capture canopy cover image over the plots. The forest plots were occupied with mixed dipterocarp trees consist of two canopy levels with 90% to 98% of canopy cover. the value of canopy cover is obtained by using WinSCanopy 2009a and RGBFisheye.exe application software that automatically calculate the diffuse transmittance (%PPFD) from digital hemispherical photographs taken with exposure setting based on the luminance of the zenith of the sky. The image of canopy cover was captured at the 25 locations at every corner of grid point for both plots, and each image is analysed by the software to give the percentage of canopy cover. Stand Visualization System (SVS) has been used to visualize the forest standing study area in 3D view based on the selected trees over the interest area. Based on the analysis, the values of canopy cover values obtained are 93.77% and 95.01% for Plot11 and Plot12, respectively. The findings from this study show that the measured interception loss values at the selected tropical forest are 284.02mm (13.55%) for Plot11 and 226.77mm (10.82%). The canopy cover does impose significant effect to the loss of rainfall interception. From point-correlation, the interception loss (%) is increase proportionally to the canopy cover (%) with r2 values of 0.4559.

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10 presentations- Topic: "Urban Planning and Sustainable Development"

Session Chair 6: Prof. Miklas Scholz

S0059 Presentation 9 (18:15~18:30)

Environmental Impact Assessment of European Non-Ferro Mining Industries through Life-cycle Assessment

Shahjadi Hisan Farjana, Nazmul Huda and M A Parvez Mahmud
School of Engineering, Macquarie University, Sydney, Australia

Abstract—European mining industries are the vast industrial sector which contributes largely on their economy which constitutes of ferro and non-ferro metals and minerals industries. The non-ferro metals extraction and processing industries require focus of attention due to sustainability concerns as their manufacturing processes are highly energy intensive and impacts globally on environment. This paper is going to address the major environmental impacts caused by the leading European metal industries based on the life-cycle impact analysis technologies. This research work is the first work in considering the comparative environmental impact analysis of European non-ferro metal industries which will reveal their technological similarities and dissimilarities to assess their environmental loads. The life-cycle inventory datasets are collected from the EcoInvent database while the analysis is done using the CML baseline and ReCipe endpoint method using SimaPro software version 8.4. The CML and ReCipe method are chosen because they are specialized impact assessment methods for European continent. The impact categories outlined for discussion here are human health, global warming and ecotoxicity. The analysis results reveal that the gold industry is vulnerable for the environment due to waste emission and similar result retained by silver mines a little bit. But copper, lead, manganese and zinc mining processes and industries are environment friendly in terms of metal extraction technologies and waste emissions.

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S0067 Presentation 10 (18:30~18:45)

Environmental Profile Evaluations of Piezoelectric Polymers using Life Cycle Assessment
M. A. Parvez Mahmud, Nazmul Huda, Shahjadi Hisan Farjana, and Candace Lang
Sustainable Energy Systems Engineering Group, School of Engineering, Macquarie University, Australia

Abstract—Piezoelectric materials are indispensable to produce electricity, harvesting ambient mechanical energy through motion for sectors and products, from sensors, to biomedical systems, to tiny electronics. Nylon 66 and tetrafluoroethylene dominate the market among thousands of piezoelectric materials to provide an autonomous power supply. Emphasis has been given on both materials due to the growing consciousness of the environmental and health threats of lead-based polymers. The fabrication steps of these polymers from raw materials are extremely hazardous to the environment in terms of toxicity and human health effects. However, no quantification of the possible environmental impacts for the manufacturing of nylon 66 and tetrafluoroethylene exists. This research paper addresses their comparative environmental effects, in terms of chemical constituents. Life cycle impact analysis has been carried out by ReCipe 2016 Endpoint, Ecopoints 97, Raw material flows and CML-IA baseline methods, using Australasian life cycle inventory database and SimaPro software. The impacts are considered in categories such as global warming, acidification, eutrophication, terrestrial ecotoxicity, human toxicity, human carcinogenic toxicity, and fine particulate matter formation, and marine ecotoxicity. The results show that there is a significant environmental impact caused by tetrafluoroethylene in comparison with nylon 66 polymer during the manufacturing process. The reason behind these impacts is the amount of toxic chemical elements present as constituents of tetrafluoroethylene raw material and its production steps. It can be anticipated that a better environmental performance can be achieved through optimization, especially by cautiously picking substitute materials and machines, taking into account the toxicity aspects, and by minimizing the impacts related to designs, fabrication processes and usage.

Session 7

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

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10 presentations- Topic: "Energy and Power Engineering"

Session Chair 7: Prof. Haruhiko Adachi

S0023 Presentation 1 (16:15~16:30)

Kinetics of Deliginification and Enzymatic Hydrolysis of non-food lignocellulose *(Bambusa Bambos)* for Cellulosic Biofuel Production

Ankur Mehta and Saikat Chakraborty
Indian Institute of Technology Kharagpur, India

Abstract—This work presents an economically viable process and its kinetic analysis for delignification and cellulase mediated enzymatic hydrolysis of non-edible lignocellulosic biomass for the production of cellulosic biofuels. The lignocellulose *Bambusa bambos* is shredded, ground and sieved, and is characterized using FESEM, FTIR, BET and XRD analyses. Our studies shows that dry *Bambusa bambos* has 22.83% lignin and is moderately porous with a crystallinity index of 36.96%.

A two-stage delignification is performed by treating with 2% NaOH followed by treatment with 2% NaOH and 10% H_2O_2, for 2 hours each at 70^oC and 100 rpm mixing speed. The first-stage second order rate constant is obtained as 15.368 $mlg^{-1}hr^{-1}$. 77.34% delignification is achieved from two-stage process. On delignification, the mean particle size of substrate decreases from 153 nm to 64 nm, while the BET surface area, BJH pore surface area and pore volume increase. The crystallinity index increases from 36.96 % to 52.56% upon delignification.

Enzymatic hydrolysis of the separated cellulose is performed using Cellulase enzyme, which is a cocktail of three different enzymes – endo-glucanase, exo-glucanase, β-glucosidase. A substrate loading range of 5-30 mg/ml, and an enzyme concentration of 2.5 mg/ml is used at 0, 50, 100, and 150 rpm mixing speeds. The maximum reducing sugar and glucose yields obtained are 69% and 23% respectively for five hours of hydrolysis, when the process is limited by non-equilibrium adsorption of the enzyme to the solid substrate. Kinetic analysis shows non competitive product inhibition in enzymatic hydrolysis of the biomass. The Michaelis constant (K_M) increases from 15.31 to 29.76 mg/ml, and the maximum reaction velocity (V_{Max}) increases from 0.128 to 0.168 mg ml^{-1} min^{-1} with increase in mixing speed from 0 to 150 rpm. The effective first order rate constant ($k_{eff} = V_{Max}/K_M$) is found to linearly decrease with mixing speed.

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10 presentations- Topic: “Energy and Power Engineering”

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S0015 Presentation 2 (16:30~16:45)

Research on Adsorption Unit of Cleaning Robot Passing the Seam Between Two Solar Panels
Ningning Chen and Xin Li
State Key Lab of Fluid Power Transmission and Control, Zhejiang University, China

Abstract—The cleanness of solar panels is an important factor in the impact of solar power generation. In order to clean the solar panels, an adsorption cleaning robot is used to clean the solar panels in this paper. However, because of the seam between the two solar panels, slipping, wheel idling and other issues appear during the robot cleaning process, seriously affecting the cleaning effect. By analyzing the effect of robot over the seam on the adsorption force, two solutions are proposed in this paper. One scheme is sticking seals between the two solar panels, another scheme is modifying the skirt design of the robot adsorption unit. By comparing the performance, the cost and simplicity of the two schemes, the second scheme is more suitable for the cleaning robot. And the design of the skirt is optimized via experiment for achieving higher energy efficient.

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10 presentations- Topic: “Energy and Power Engineering”

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S0017 Presentation 3 (16:45~17:00)

Transient analysis of a solid oxide fuel cell stack with crossflow configuration
Ping Yuan and Syu-Fang Liu
Lee Ming Institute of Technology, Taiwan

Abstract—This study investigates the transient response of the cell temperature and current density of a solid oxide fuel cell having 6 stacks with crossflow configuration. A commercial software repeatedly solves the governing equations of each stack, and get the convergent results of the whole SOFC stack. The preliminary results indicate that the average current density of each stack is similar to others, so the power output between different stacks are uniform. Moreover, the average cell temperature among stacks is different, and the central stacks have higher temperature due to its harder heat dissipation. For the operating control, the cell temperature difference among stacks is worth to concern because the temperature difference will be over 10 ℃ in the analysis case. The increasing of the inlet flow rate of the fuel and air will short the transient state, increase the average current density, and drop the cell temperature difference among the stacks. Therefore, the inlet flow rate is an important factor for transient performance of a SOFC stack.

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10 presentations- Topic: “Energy and Power Engineering”

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S0014 Presentation 4 (17:00~17:15)

Investigating the effect of intake temperature, compression ratio, and EGR on the natural gas HCCI engine

Mohsen Pourfallah and **Mahbod Armin**
Mazandaran University of Science and Technology, Iran

Abstract—Different approaches have been proposed to improve the combustion process and diminish pollutants of internal combustion engines, among which the use of the homogeneous charge compression ignition (HCCI) combustion concept has gained more attention. The advantages of this combustion concept are the simultaneous reduction of fuel consumption nitrogen oxides (NOx) and soot emission together with thermal efficiency improvement. However, there are challenges such as combustion phasing control and high heat release rate intrinsic to this concept. In this study, open cycle simulation of the HCCI engine validated by experimental results of the single cylinder HCCI engine is used to investigate the effect of intake temperature, compression ratio, exhaust gas recirculation (EGR), and reformer gases. The simulation is done by parallelizing three -dimensional combustion simulation of FIRE and one-dimensional simulation of GT-Power packages. Experimental data were extracted from a single cylinder engine and the simulation results were compared to the experimental data. The comparison showed the numerical data had a good accordance with experimental data. The intake temperature has a significant influence on the ignition since the combustion reaction rate depends exponentially on the temperature. Furthermore, intake temperature variation influences the amount of engine-out emission such as NOx, carbon monoxide, and unburned hydrocarbon. The compression ratio is limited by the self-ignition temperature of the air-fuel mixture at the end of the compression, and the occurrence of the knock. Increasing the compression ratio leads to advanced combustion and reduces the combustion duration. Moreover, compression ratio influences the amount of pollutant emissions. EGR is used to decrease the combustion temperature and subsequently reduce the NOx emission. The maximum amount of EGR rate in conventional engines is determined by the amount of dilution and the range of flammability of the mixture.

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10 presentations- Topic: “Energy and Power Engineering”

Session Chair 7: Prof. Haruhiko Adachi

S0029 Presentation 5 (17:15~17:30)

Energy Integration of High Pressure Processes with Gas Turbines and Internal Combustion Engines

Yoana Garc á, Fidel A. Mato, Juan Garc á, Mar á Jos é Cocero
High Pressure Processes Group, Department of Chemical Engineering and Environmental Technology, EII Sede Mergelina, University of Valladolid, SPAIN

Abstract—High pressure processes (e.g. sustainable hydrothermal manufacturing of nanomaterials [1], supercritical water oxidation (SCWO) [2] or biomass hydrolysis [3]) require high operational conditions. Water at high pressure and temperature conditions improves kinetic, selectivity and efficiency of these processes but entail high-energy operational expenditure. Reasonable solutions for energy recovery and integration are needed in order to achieve the energy self-sufficiency of the process and, if possible, the net power production and with a viable efficiency [4].

One solution that has been recently proposed is the integration of supercritical processes with energy production using Combined Heat and Power (CHP) systems. CHP processes are often implemented using gas turbines (GT) or internal combustion engines (ICEs) [3, 5]. SCWO process produce a high pressure, high temperature reactor outlet stream, mainly composed of water, nitrogen and carbon dioxide. This effluent can be used as a steam injection in the GT or in the ICE improving the efficiency of the global process. Steam injection can increase the power outcome of a plant without burning extra fuel and requiring moderate capital investment.

In a previous work, several GT configurations were simulated using experimental data obtained [2] in a SCWO pilot plant, considering different injection pressures. Global efficiency increases were over 25% and going up to 34.6% in the best case [5].

ICEs can yield higher average efficiency than GT (up to 50% ICE) and furthermore, due to increased pressure and temperature in modern commercial ICEs, it is possible, in principle, the injection at high pressure and temperature conditions, taking then advantage of the whole high enthalpy content of the reactor outlet stream.

Other authors observed reduced ICE NOx emissions when water is injected into the engine cylinder due to maximum flame temperature decreasing [6]. In the SCWO process, the reactor outlet stream consists mainly of water (59%), so injection of this effluent in an ICE could both led to NOx reduction and power recovering.

Numerical simulation of the expansion inside the cylinder, which is an inherently non-steady state process, cannot be modeled using commercial process simulators. Besides, wide conditions changes and strong non-idealities caused by compounds molecular interactions

suggest a custom code based on Equation of State [7,8] in order to calculate thermodynamic properties. Promising results have been obtained, the simulation suggesting the worth of exploring the practical implementation.

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10 presentations- Topic: “Energy and Power Engineering”

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S0045 Presentation 6 (17:30~17:45)

Study on Latent Heat Cooling Method for Hot Stamping Mold Cooling System
Junho Kwon, Sungho Yun, Kang Sub Song, Wonhee Cho and Yongchan Kim
Department of Mechanical Engineering, Korea University, Seoul, Korea

Abstract—Lately, with the increasingly strict safety standards and environmental regulations, and demand for improvement in fuel efficiency, efforts are being made to develop technologies for manufacturing high strength and lightweight materials in the field of automobile industry. The hot stamping method is designed to obtain high strength and lightweight steel sheets, and the strength of the obtained material can vary depending on the cooling rate of the material. On the other hand, in the existing hot stamping mold cooling system, water is used as a refrigerant and it cools the system using sensible heat. When the cooling method varies from using sensible heat to latent heat, the quality of the product can be improved because the cooling performance can be enhanced and the temperature deviation of the mold surface can be reduced. However, research that applies latent heat cooling method to the hot stamping mold cooling system is very limited. So, in this study, by using R134a as the working fluid in the hot stamping mold cooling system, the improvement of the cooling performance was confirmed by comparing with the conventional cooling method using sensible heat. Under the same mold inlet temperature condition, the system using R134a resulted in a lower outlet temperature compared to water for all experimented flow rates. In addition, the cooling rate obtained from R134a was higher for all flow rates. It is possible to increase the maximum cooling heat quantity in the conventional hot stamping mold cooling system using R134a instead of water at the same flow rate. Besides, it is possible to obtain a material having relatively uniform tensile strength depending on its position.

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10 presentations- Topic: “Energy and Power Engineering”

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S0046 Presentation 7 (17:45~18:00)

Numerical Study on the Influence of Superheat at Compressor Inlet on the Performance of a Carbon Dioxide Heat Pump Water Heater

Kyeongsoo Song, Hanseok Mun, Junyub Lim, Jeonghoon Lee, Yongchan Kim
Department of Mechanical Engineering, Korea University, Seoul, Republic of Korea

Abstract—In order to contribute to mitigate global warming and to meet the needs of developing high efficiency heat pump systems, we investigate the performance of a heat pump water heater (HPWH) using carbon dioxide (CO2) as a refrigerant. In particular, the influence of degree of suction superheat at the compressor inlet on the performance of the CO2 HPWH is primarily examined. In order to investigate the influence of the degree of suction superheat on the CO2 HPWH, an analytical model of a 6-kW household CO2 HPWH is developed by using a finite-volume method. At a high ambient temperature condition of 34 ℃, it is confirmed that changes in the degree of suction superheat have a great effect on the COP of the CO2 HPWH. In addition, by increasing the degree of suction superheat of the CO2 HPWH from 5 ℃ to 17 ℃, the compression ratio of the system is increased to rise discharge temperature from 70 ℃ to 100 ℃ and to decrease CO2 mass flow rate from 160 kg/h to 120 kg/h.

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10 presentations- Topic: "Energy and Power Engineering"

Session Chair 7: Prof. Haruhiko Adachi

S0057 Presentation 8 (18:00~18:15)

Multiple stacked nanogenerators for electric power increment
Yohan Choi, Gul Hassan, Muhammad Umair Khan, and **Jinho Bae**
Department of Ocean System Engineering, Jeju National University, South Korea

Abstract—Device miniaturization and the development of a low power wireless communication protocols enable the fabrication of smaller devices. Despite of its low power consumption, the batteries still require periodic replacement to help maintain the system operation. Hence, nanogenerators (NGs) are paying attention to work as energy source in self-powered mirco-nano system, and many researchers are studying how to achieve a higher power. In fact, piezoelectric and triboelectric transduction mechanisms are well known for nano energy generators. However, these are required a large area to get high power generation. For this reason, we propose vertically stacked NGs as zigzag pattern harvesting multiple piezoelectric NG (PENG) or triboelectric NG (TENG) on the same area at the similar time. In the proposed PENG and TENG, they are fabricated by Polydimethylsiloxane (PDMS) and perovskite Zinc stannite (PDMS+ZnSnO3) nano cubes with high charge polarization of 59 uC/cm2, respectively. To effectively covert mechanical energy for each stacked NG, an edge side of each NGs is connected as zigzag pattern, and it makes gaps in between NGs due to space on the uncoupled side. To verify the proposed multiple stacked NG devices, we fabricate three stacked PENG and TENG, and their size are both 4 cm × 4 cm, respectively. When a single PENG generates 25 V, three stacked PENG is achieved a peak voltage of 70 V, and a number of peaks per a second is the same as a single PENG with 10 peaks/sec. When a single TENG generates the number of peaks of 15 peaks/sec, three stacked TENG is increased as 30 peaks/sec, and its peak voltage is the similar as a single NG with 130 V. It is feasible to say that the proposed NG can be utilized as a source for the various self-power Systems.

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10 presentations- Topic: “Energy and Power Engineering”

Session Chair 7: Prof. Haruhiko Adachi

S0038 Presentation 9 (18:15~18:30)

Decentralized and Cost-Effective Solar Water Purification System for Remote Communities

Hafiz Muhammad Abd-Ur-Rehman
School of Mechanical & Manufacturing Engineering, National University of Sciences & Technology, Pakistan

Abstract—In this study, a modified stepped solar still is proposed for water desalination. The overall objective of this work is to develop and test the proposed still design to identify the productivity enhancement as compared to conventional basin type solar still. The proposed design takes the advantage of its stepped configuration that allows the water stream to maintain a minimum desirable water column height and the water flow through the stages under the force of gravity. A minimum water depth in the still results in a higher rate of evaporation. The still is also incorporated with Fresnel lens to increase the water temperature that eventually increases the rate of water evaporation. Another important aspect of this design is the incorporation of phase-change-material (PCM) to increase the operational hours of the solar still. Consequently, daily productivity of fresh water is increased.

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10 presentations- Topic: “Energy and Power Engineering”

Session Chair 7: Prof. Haruhiko Adachi

S0060 Presentation 10 (18:30~18:45)

Potential of Sweet Sorghum Genotypes in Mediterranean Condition

Celal Yucel, Derya Yucel, İlker İnal, Feyza Gündel, Hasan Ali Karaagac, Rüştü Hatipoğlo and İsmail Dweikat
Eastern Mediterranean Agriculture Research Institute, Adana, TURKEY

Abstract—Decreasing the availability of fossil energy sources in the world, alternative energy sources that are cost effective and technologically sound need to be developed. Sweet sorghum (Sorghum bicolor (L.) Moench) with sugar-rich stalks and water-use efficiency is a strong candidate for a cheap and renewable source of energy as well as, very good potential as an alternative feed stock for non-competing with human feed on land. First generation biofuels, like ethanol mixed with gasoline and diesel are used in several countries
The objective of this proposal is to evaluate the potential of different sweet sorghum genotypes as a source of bio-fuel production. The experiment was conducted at the Eastern Mediterranean Agricultural Research Institute (Adana province, 36 °51' 35" N and 35 °20' 43" E) in South of Turkey during the second crop season of 2016. Twenty one sweet sorghum genotypes obtained from various sources were used as material and each genotype was sown in four rows of 5 m long and 0.7 m apart in June13th according to randomized complete block design with four replications. As a result of the experiment, days to flowering , plant height, stalk yield, juice yield, brix, and theoretical ethanol value were ranged from 55.0 to 101.5 days, 216.1to 411.5 cm, 58.6 to 203.2 t ha-1, 22020 to 65460 l ha-1, 10.75 to 20.75 %, and 1760 to 6060 l ha-1 respectively. Hence, over 5000 liters theoretical bio-ethanol yield was obtained from six sweet sorghum genotypes from all investigated genotypes in South of Turkey. These result demonstrated that sweet sorghum is very well adapted to Mediterranean conditions of Turkey.

Session 8

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

D0088 Presentation 1 (16:15~16:30)

Problems of groundwater extraction from transboundary aquifers and complexes

E I Golovina
Saint-Petersburg Mining University, Saint-Petersburg, Vasilyevsky Island, 21st line 2, 199106, Russia

Abstract—Water is one of the most important vital types of natural resources used in almost all spheres of life and human activity. It is the availability of water that determines development of industry and agriculture. Its selection and irretrievable losses can have a significant impact on the state of the natural environment. Geology of the earth's surface is arranged in such a way that boundaries of groundwater aquifers and complexes distribution do not coincide with the boundaries of states, and therefore extraction of this priceless resource must be regulated at the international level. The development of a unified universal concept for groundwater production, namely the system of state regulation, monitoring, taxation and planning should be based on the experience of advanced countries such as Russia, Germany, France, etc., where a vast experience of scientific and research activity is accumulated. Many international conflicts can be prevented if one approaches the problems of subsoil use on the basis of a general agreement. The aim of the research is development of an international conceptual model for groundwater production management through regulation of specification systems, monitoring, licensing, control of groundwater extraction. Features of groundwater extraction from transboundary aquifers are considered, international experience of conflict regulation in this sphere is reviewed, recommendations and prerequisites for the development of an international system for the groundwater extraction management are given.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

D0014 Presentation 2 (16:30~16:45)

Evaluation of the effects of surface slope in discretization of groundwater models

D K S Y Klaas, M A Imteaz, A Arulrajah, I Sudiayem, E M E Klaas and E C M Klaas
Swinburne University of Technology, VIC, Australia

Abstract—A robust representation of hydrogeological properties of the examined study area in discretization step is essential in groundwater modelling to improve the accuracy and efficiency of the model. A number of studies have investigated the effect of grid cell size in model discretization using comparison of performances of different models representing different cell sizes. However, although grid size refinement effect on model performances was calculated, the impact of mean slope was not conclusively discussed. In this study, five models distinguished by five spatial discretization schemes; 10 x 10 m, 20 x 20 m, 30 x 30 m, 40 x 40 m and 50 x 50 m were constructed. Using PEST, hydraulic conductivity and specific yield values over a selection of pilot points were estimated. The effect of surface slope is discussed in order to recommend the most appropriate location for observation well placement in terms of topographical characteristic. It is confirmed that the deterioration of model performance is controlled by mean slope of the surface. Results reveal that model performance increases substantially for areas of low slope (< 3 %) and medium slope (3 ~ 10 %) for smaller a grid cell size. Therefore, to improve model performance, it is recommended that the observations wells are placed in areas of low and medium slopes.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

D0023 Presentation 3 (16:45~17:00)

Using Remote Sensing Techniques for Estimating Water Stress Index for Central of Nile Delta

Ayat Elnmer, Mosaad Khadr, Ahmed Tawfik
Egypt-Japan University of Science and Technology, Alexandria, Egypt.

Abstract—Water scarcity is one of the main challenges facing water management in Egypt. This in turn will have direct impacts on the agricultural sector which is a key sector for the socio-economic development in Egypt, and plays a significant role in the Egyptian national economy. In Egypt, water resources are limited to the Nile River, rainfall, deep groundwater, and potential desalination of sea. Climate change, rapid population growth, and economic development will significantly affect the future availability of water resources for agriculture sector, which consumes about 85% of total water resources in Egypt. Therefore, continuously monitoring of crop statutes and crop water consumption plays a vital role in water resources management in developing countries such as Egypt. Recently Remote sensing techniques provide decision makers with spatial information about crop statutes and water stress at region scale. Remote sensing techniques also have the ability to monitor large areas with saving time and cost. The main objective of this study is investigating the capabilities of satellite data in monitoring of water stress and crop statues in the central portion of Nile delta by using the water stress index (WSI). The water stress index was used to identify locations of poor irrigation in order to maximize the crop yield. The proposed model was calibrated and validated against the measured data by using 20 points of ground measurements for actual evapotranspiration (ET_C) and wet evapotranspiration (ET_{Wet}). The performance of the model was measured using various evaluation criteria. Validation results showed that satellite data are capable of estimating WSI since the comparison between WSI_{obs} and WSI_{est} resulted in R^2=0.5003. Therefore WSI can be considered as a quick, costless and moderate tool to provide farmers and decision makers with spatial information about crop statues and water stress.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

D0098 Presentation 4 (17:00~17:15)

Characteristics of Hydrogen and Oxygen Stable Isotopes of Different Water Bodies in Peixian Coal Mining Subsidence Area in Jiangsu Province, China

Mengyu Ge, Junfeng Qu, Anni Wang and Baozhang Chen
China University Of Mining and Technology, China

Abstract—As a result of long-term well mining activities, a large area of coal mining subsidence has formed in the mining area in Peixian County, Jiangsu province, an important energy base in eastern China. This subsidence filled by water made the local water cycle become more complicated and severe geological hazards easy to occur. Oxygen-stable isotope, playing an important role in the study on water-cycle mechanism, is a substantial way to track different sources of water in nature. In this study, we took samples from different water bodies of soil water, the surface waters (river, lake and collapse pit) and the groundwater (well water) seasonally in a year. The analyses of δD and $\delta^{18}O$ were further conducted to trace the transforming relationships between these water bodies. The findings are as follows: (i) precipitation is the main charge source of soil water, along with significant evaporation processes; (ii) with soil depth increasing, δD and $\delta^{18}O$ of soil water showed a trend like that first decreasing to a certain value and then stabilizing and finally increasing to the bottom of soil profile; (iii) when the reclamation soil experienced longer time, the values of soil water δD and $\delta^{18}O$ increased in the whole profile, and this character was more obvious in deeper layers than in shallower and in surface layers; (iv) indicated from the isotopic characters of different water bodies and precipitation that precipitation was the main source of recharge of collapse pit water, and the infiltrated soil water and ground water experienced mixing with river water and precipitation by the water pathways conducted through the entire Cenozoic coal seam by mining.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

D0024 Presentation 5 (17:15~17:30)

Numerical study of local scour around bridge piers
H Omara and A Tawfik
Egypt - Japan University of Science and Technology, Alexandria, Egypt

Abstract—Numerical models have more flexibility avoiding the critical limitation in physical ones. The predictive capability of the hydro-morphological model around bridge piers in clear-water conditions have been investigated using mathematical modelling flow 3D 11.2 as there is a lack in using that model. The objective of the study to investigate the effect of cross section of the pier on the predictive capability of the model. Computations has been performed and the results are compared with several sets of experimental data available in the literature. The Van Rijn sediment transport model and (RNG) k-ε model are used. However, this study strongly demonstrates that a 3D hydro-morphological model can effectively predict the scour around piers with different cross section, there is significantly under predicts for the scour depth at the nose of the pier with different pier shapes. It is found that for the circular pier the capability of the model depending on the flow properties not only the geometry of the pier.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

D2001 Presentation 6 (17:30~17:45)

The experimental study of a novel wastewater treatment technology for WFGD of coal-fired power plants

Xiang Li, Chenghang, Zheng Xiang Gao
Zhejiang University, Hangzhou, Zhejiang, China

Abstract—Large amount of wastewater is generated as a by-product of the wet flue gas desulfurization (WFGD) technology in coal-fired power plants, which is difficult to dispose because of its complex components and corrosive nature. A novel technology routine is proposed to concentrate and evaporate the wastewater; experiments were also done to study the evaporation properties of Cl^- when different positive ion exist in the solution. The wastewater was circulated in a concentration tower with exhaust flue gas downstream of the gas preheater as the evaporation medium. In this study, experiments were conducted to investigate the properties of the wastewater under concentration ratios ranging from one to seven, including conductivity, pH value and ion concentrations. Concentration of Cl^-, Na^+, Mg^{2+}, NH_4^+ increased almost linearly with the concentration ration of the waste water, when Ca^{2+} increased relatively more slowly, but the concentration of SO_4^{2-} just increased slightly and fluctuated around a stable level. Influence of SO_2 and SO_3 on the component fraction and pH were also investigated; results showed that the pH could decrease to approximately 2.0. The sediment amount increased with the concentration ratio, and analyzed with Scanning electron microscope (SEM) and Energy Dispersive Spectrometer (EDS). Results showed that the sediments were in the form of fibrous cells with the atom fraction of S increasing remarkably while Si and Al decreasing. It was found that an obvious larger portion of Cl element loss in $CaCl_2$ or $MgCl_2$ than in NaCl or KCl solution. This technology was verified to be feasible and low-cost by experiments and can hopefully be applied in real coal-fired plants.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

S0036 Presentation 7 (17:45~18:00)

Role of pretreatment in increasing adsorption of Mercury, Nickel and Cobalt onto dry biomass of Native Algae

Rizwan Muhammad, Alia Naz, Abdullah Khan, Wisal Shah, Mona Sayed, Qadeer Ahmed and Fatima Noor
University of Haripur, Pakistan

Abstract—In the present study, a native macroalgae was used as an inexpensive and efficient biosorbent for the removal of mercury (Hg), nickel (Ni) and cobalt (Co) removal from synthetic wastewater. The algal biomass was pretreated with 0.1 HCl, 0.2 HCl, CaCl2, NaOH, Na2CO3 and hot water for enhancing the removal efficiency of Hg, Ni and Co. The biosorption efficiency was also compared with untreated biomass. Maximum biosorption for Hg was 49%, 39%, 37%, 37%, 31%, 31% and 18% for NaOH, hot water, CaCl2, Na2CO3, 0.1 N HCl, 0.2N HCl and untreated algae respectively. Similarly maximum removal efficiency for Ni was 36%, 29%, 27%, 21%, 20%, 17% and 17% for Na2CO3, NaOH, untreated, CaCl2, 0.2N HCl hot water and 0.1 N HCl respectively. Similarly maximum removal efficiency for Co was 53%, 42%, 39%, 31%, 29%, 15% and 13% for Na2CO3, CaCl2, NaOH, untreated, hot water, 0.1 N HCl and 0.2N HCl. From our current study it was concluded that NaOH pre-treatment was most suitable for the removal of Hg while Na2CO3 pretreatment was the best technique for the removal of Ni and Co.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

S0073 Presentation 8 (18:00~18:15)

Fluoride Removal by Activated Alumina Adsorbent

Usha Kumari, B.C. Meikap
Department of Chemical Engineering, Indian Institute of Technology, Kharagpur, India,

Abstract—Research has been done on fluoride removal from sulfuric acid activated alumina (Al2O3) by adsorption mechanism. Batch scale experiments have been done by taking synthetic waste water of fluoride. Various parameter affecting the defluoridation has been studied such effect of initial pH, initial fluoride concentration, adsorbent dose, contact time, adsorption capacity, effect of stirring rate and presence of co-ions. In addition kinetics studies and isotherm studies have been done. The characterization of activated alumina before and after activation has been done by FESEM, EDS, FTIR, BET, XRF, XRD etc. The chemical ratio (activating agent/precursor) has been kept 100%. The maximum efficacy of activated alumina is found to be 96.72% at pH 6.5, adsorbent dose of 14 gm/l, initial fluoride concentration of 40 ppm, stirring rate of 400 rpm having contact time of 3 hr. Drop in ppm level of fluoride is from 40 ppm to 1.32 ppm which is below the permissible limit of WHO. The kinetics and isotherm study reveals that adsorption is following pseudo second order kinetics and Freundlich isotherm respectively. Characterization data indicates that alumina used for the experiments is 97.88% pure and amorphous. Its amorphous nature has been increased on acidic activation. FESEM analysis shows that activation of alumina resulted into cracks developed on adsorbent surface which has enhanced the fluoride adsorption site on adsorbent. EDS and FTIR plot shows the successful adsorption of fluoride on adsorbent. Fluoride removal efficiency of alumina with and without activation resulted into 96.72% and 66.26%.

Afternoon, February 8, 2018 (Thursday)

Time: 16:15~18:30

Venue: Palais + Breches

9 presentations- Topic: "Water Resource Management and Wastewater Treatment"

Session Chair 8: Prof. Susan Richardson

S0077 Presentation 9 (18:15~18:30)

Removal of methylene blue from wastewater using ash by a ribbed hydrocyclone
Gayatree Patra, S. Chakraborty, B. C. meikap
Department of Chemical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

Abstract—Excessive methylene blue concentration in water is a major health concern worldwide. In this current study, experiments have been conducted to remove methylene blue from aqueous solution using ash in a continuous mode. A spiral rib was introduced in the cylindrical part of the conventional hydrocyclone to increase the performance, and the new hydrocyclone is dubbed as ribbed hydrocyclone. Experiments were carried out to analyze the performance of the ribbed hydrocyclone and compared the results with the conventional hydrocyclone of the same dimension. The efficiency of conventional and ribbed hydrocyclone at a slurry flow rate of 40 LPM (litre per minute) for the solid concentration of 1 wt% were 76% and 90% respectively. The cut size d50 of the conventional and ribbed hydrocyclone was 30 μm and 24 μm respectively at a slurry velocity of 40 LPM. Methylene blue removal efficiency using ash was also investigated in a continuous mode by the ribbed hydrocyclone. Maximum methylene blue removal efficiency was 86% for the initial concentration of 10 mg/l at a slurry flow rate of 40 LPM.

Dinner Time	**18:45**

POSTER

February 7, 2018 (Wednesday) 13:00~17:00

February 8, 2018 (Thursday) 9:00~18:45

D0060

Building of platform for development of integrated model to assess climate change impacts and vulnerability

S H Chae and M J Lee
Korea Environment Institute, Republic of Korea

Abstract—Climate change, by its nature, will affect various realms such as society, economy and the environment. In this sense, it is necessary to develop technologies to assess climate change impacts that can pre-emptively consider individual fields including health, water management, forest, agriculture and ecosystems as well as accidents and disasters, and the interaction among the fields in order to analyse climate change impacts. To provide a platform for the integrated assessment models to develop the climate change integrated impacts and vulnerability assessment models and address political issues, MOTIVE (Model of InTegrated Impacts and Vulnerability Evaluation of climate change) has been conducted as a part of a national R&D project since 2014. Under the project, the study built the common DB with 101 integrated items and 1,355 layers that can be commonly used by each field and the DB utilization system, and also developed a tool that displays the results of the climate change impacts and vulnerability assessment models by field. The tool maximized convenience by providing various analysis functions such as visualization, spatial distribution, bias and schematization of the vulnerability assessment results by field. Using the platform of the DB utilization system and the resulting display tool of MOTIVE, it is possible to compare and analyse the results of the climate change impacts and vulnerability assessment models by field, which is likely to be used as an effective means of decision making in the future. This platform will serve as a foundation for building the basis upon which integrated models can be utilized to assess climate change impacts and vulnerability in the future.

POSTER

February 7, 2018 (Wednesday) 13:00~17:00

February 8, 2018 (Thursday) 9:00~18:45

D3001

Development of a high-throughput Zebrafish imaging system for toxicity analysis of metal cutting fluids and their common compounds

Jae-Hoon Han and **Sang-Kyu Jung**
Bio. & Chemical Engineering, Hongik University, South Korea

Abstract—Metalworking fluids (MWFs) have been widely used in various industrial processes. However, about 10 million industrial workers are exposed to MWFs and various human health hazards have been reported. Systematic toxicity study on water soluble MWFs is difficult since MWFs contain multiple chemical compounds up to 15~20, and hydrophobic compounds form complex emulsion particles by surfactants. For a quantitative toxicity study of MWFs, we have developed an automated high-throughput imaging system using Zebrafish larvae. The imaging system is composed of a high resolution digital webcam, z-axis linear slide, lighting plate, and spot plate as well as automated imaging capture and analysis software. Using the system, we tested about 20 different chemical compounds and 6 commercial MWFs. By computing a locomotion activity of individual Zebrafish larva from captured time lapse images, we were able to quantify the degree of relative toxicity of various MWFs and their ingredients.

POSTER

February 7, 2018 (Wednesday) 13:00~17:00

February 8, 2018 (Thursday) 9:00~18:45

D3012

The Fixation of CO2 Effect on Microalgae in relation to different CO2 Concentration

Hyomin Park and Sangdon Lee
Ewha Womans University, Seoul, Korea

Abstract—One of the recent global environmental problems is the increase of atmospheric CO2 and CO2 accounts for 80% of total greenhouse gas emissions. A number of studies are underway to reduce CO2 in order to solve the environmental problems caused by the increase of CO2. Among the various methods for CO2 reduction, the biological fixing method uses micro algae. Microalgae are microorganisms that have chlorophyll and fix CO2 by photosynthesis to produce energy source. The purpose of this study is to investigate the species of microalgae in natural rivers and to evaluate the CO2 fixation efficiency of microalgae in natural rivers.

In order to obtain optimal CO2 fixation efficiency, the CO2 concentration (5%, 10%, 15%) and CO2 injection rate (0.25LPM, 0.5LPM) were injected differently into the microalgae and Biomass and chlorophyll-A of microalgae were analyzed to determine CO2 fixation efficiency.

The result of biomass of microalgae showed that the highest biomass of microalgae was injected with 0.25LPM of 5% CO2 and the lowest biomass of microalgae was injected with 0.25 LPM of 10% CO2. The result of chlorophyll-A of microalgae showed that the highest chlorophyll-A of microalgae was injected with 0.5LPM of air and the lowest chlorophyll-A was injected with 0.25 LPM of 15% CO2.

POSTER

February 7, 2018 (Wednesday) 13:00~17:00

February 8, 2018 (Thursday) 9:00~18:45

D3014

Seasonal dynamics of temperature in the river with multi-functional weir

Hye Won Lee, **Min Kyung Kim** and Jung Hyun Choi
Ewha Womans University, Seoul , Korea

Abstract—With the global trend to construct artificial impoundments over the last decades, there was a Large River Restoration Project conducted in South Korea from 2010 to 2011. The project included enlargement of river channel capacity and construction of multi-functional weirs, which can alter the hydrological flow, sediment transportation and benthic fluxes of carbon and nutrients. The study site has a multi-functional weir operated to maintain its designed water level. The river upstream of weir is expected to be river-reservoir system due to the regulated hydrological regime. The construction and operation of multi-functional weir can influence physiochemical characteristics of the river-reservoir system through the altered hydrological flow and sediment-water interactions. To represent seasonal dynamics of temperature in the river-reservoir system, a three-dimensional time variable model, Generalized, Longitudinal-Lateral-Vertical Hydrodynamic and Transport (GLLVHT) was selected. The computational grid of the three-dimensional model was developed using the GIS. The horizontal grid is composed of 1410 active cells at the surface layer with spacing varies from EL. 10.0 m to 22.0 m. There are 12 vertical layers with uniform thickness of 1.0 m resolution. To calibrate the model, model prediction for temperature was compared with field collected data. The model results showed a good agreement with field measurements. From the model results, the followings are determined and discussed: (1) seasonal dynamics of temperature in the river-reservoir system (2) the role of multi-functional weirs on the physiochemical characteristics of the river.

POSTER

February 7, 2018 (Wednesday) 13:00~17:00

February 8, 2018 (Thursday) 9:00~18:45

S0058

Potential of Sweet Sorghum Genotypes on Carbon and Nitrogen Dynamic under Semi-arid Climatic Condition in Turkey

Derya Yucel, Celal Yucel, Ibrahim A. Malik Ahmed and Ibrahim Ortaş
Eastern Mediterranean Agriculture Research Institute, Adana, Turkey

Abstract—Sweet sorghum is annual crops from which the sap can be fermented to ethanol. Little information exists on sweet sorghum genotypes under field conditions, which can be a major determinant of sweet sorghum nitrogen (N) and carbon (C) input to soil. Studying the root traits of sweet sorghum genotypes could help to understanding C and N dynamics in soils. The aims of this study were to screen sweet sorghum genotypes for their C and N input to soils. Forty-nine sweet sorghum genotypes were tested under field growing condition in 2015 at the Eastern Mediterranean Research Institute Adana, Turkey. Average across sweet sorghum genotypes, the values of root biomass, soil C content, root C content, total nitrogen content within soil, and root N content were ranged between 7505 to 3432 kg/ha, 46 to 57 t/ha, 57 to 40 %, 142 to 126 kg/ha and 1.2 to 0.5 %, respectively. Therefore, this study concluded that sweet sorghum genotype has the ability to input carbon in soil, as well as can affect C and N dynamic in both soil and plant tissue. Based on our field studies, it is suggested that sweet sorghum genotypes can be successfully grown under semi-arid climatic condition of Turkey with little risk to environment.

Listeners

Mohsen Hosseinzadegan
Mazandaran University of Medical Scienc, Iran

Haruhiko Adachi
Tokyo Institute of Technology, Japan

Diyardokht Rahemi
Babol University of Medical Science, Iran

Tatiana Stremel
UNICESUMAR, Ponta Grossa, Paraná, Brasil

HAN HUI LYEONG
Chonbuk National University, South of Korea

Lee Su Jin
Chonbuk National University, South of Korea

TAEYEON PARK
Institute of Culture convergence Archiving, Republic of Korea

Ji Hoon Lim
Chonbuk National University, South of Korea

Daojarus Ketrot
Kasetsart University, Thailand

Saowanuch Tawornpruek
Kasetsart University, Thailand

Hichem CHENAKER
University of Abbes laghrour Khenchela, Algeria

KITTIPON CHITTANUKUL
PTT Public Company Limited, Bangkok, Thailand

RACHIT SATTAPUN
PTT Public Company Limited, Bangkok, Thailand

LORENA DAVIDEL
ALEXANDRU IOAN CUZA" UNIVERSITY FROM IAȘI, ROMANIA

One Day Tour

February 9, 2018 (Friday)

9:00~17:00

(Tip: We will gathering at the hotel at 8:50am and departure at 9:00am. The following places are for references, and the final schedule should be adjusted to the actual notice.)

1. (8:50am) Assemble at NOVOTEL PARIS CRETEIL LE LAC

2. (9:00-10:30am) Notre Dame de Paris

Notre-Dame de Paris (French meaning "Our Lady of Paris"), also known as Notre-Dame Cathedral or simply Notre-Dame, is a medieval Catholic cathedral on the Île de la Cité in the fourth arrondissement of Paris, France. The cathedral is widely considered to be one of the finest examples of French Gothic architecture, and it is among the largest and best-known church buildings in the Catholic Church in France, and in the world. The naturalism of its sculptures and stained glass serve to contrast it with earlier Romanesque architecture.

3. (10:30-12:00pm) Louvre

The Louvre or the Louvre Museum (French: Musée du Louvre), is the world's largest art museum and a historic monument in Paris, France. A central landmark of the city, it is located on the Right Bank of the Seine in the city's 1st arrondissement (district or ward). Approximately 38,000 objects from prehistory to the 21st century are exhibited over an area of 72,735 square metres (782,910 square feet). In 2016, the Louvre was the world's most visited art museum, receiving 7.3 million visitors.

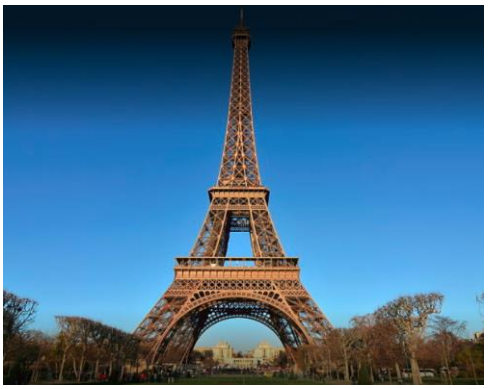
4. (12:00-13:00pm) Lunch time

5. (13:00-14:30pm) Place de la Concorde

The Place de la Concorde is one of the major public squares in Paris, France. Measuring 8.64 hectares (21.3 acres) in area, it is the largest square in the French capital. It is located in the city's eighth arrondissement, at the eastern end of the Champs-Élysées. It was the site of many notable public executions of royalty during the French Revolution.

The place was designed by Ange-Jacques Gabriel in 1755 as a moat-skirted octagon between the Champs-Elysées to the west and the Tuileries Garden to the east. Decorated with statues and fountains, the area was named the Place Louis XV to honor the king at that time. The square showcased an equestrian statue of the king, which had been commissioned in 1748 by the city of Paris, sculpted mostly by Edmé Bouchardon, and completed by Jean-Baptiste Pigalle after the death of Bouchardon.

6. (14:30-16:00pm) Eiffel Tower



The Eiffel Tower is a wrought iron lattice tower on the Champ de Marsin Paris, France. It is named after the engineer Gustave Eiffel, whose company designed and built the tower.
Constructed from 1887–89 as the entrance to the 1889 World's Fair, it was initially criticized by some of France's leading artists and intellectuals for its design, but it has become a global cultural icon of France and one of the most recognisable structures in the world.[3] The Eiffel Tower is the most-visited paid monument in the world; 6.91 million people ascended it in 2015.

7. (16:00-17:00pm) Triumphal arch

A triumphal arch is a monumental structure in the shape of an archway with one or more arched passageways, often designed to span a road. In its simplest form a triumphal arch consists of two massive piers connected by an arch, crowned with a flat entablature or attic on which a statue might be mounted or which bears commemorative inscriptions. The main structure is often decorated with carvings, sculpted reliefs, and dedications. More elaborate triumphal arches may have multiple archways.

8. 17:00pm-Back to Hotel

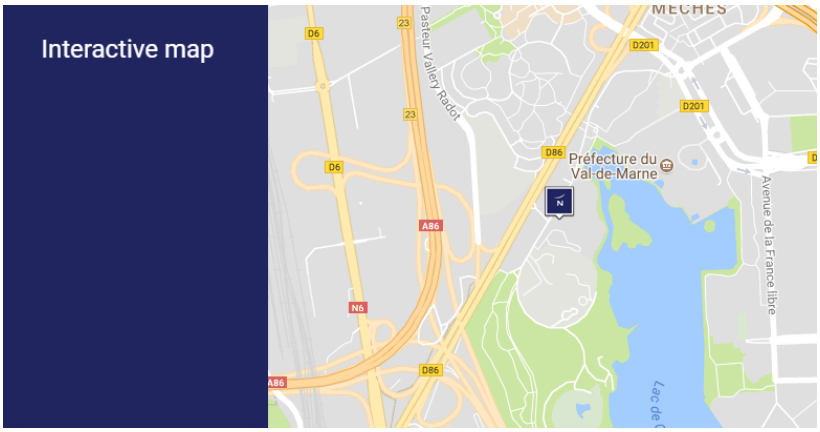
Conference Venue

NOVOTEL PARIS CRETEIL LE LAC

http://www.novotel.com/fr/hotel-0382-novotel-paris-creteil-le-lac/index.shtml
Address: Rue Jean Gabin, 94000 Creteil

Transportation to Hotel:
By metro: take line 8 to Créteil Université.
By RER: take line A toward Boissy St Léger, exit at St Maur/Créteil. Take the TVM bus to Base de loisirs (recreational park).
From Versailles on A86 highway: take exit 23 for Créteil Centre and Créteil/N186. Take the first right after the Total service station. From Paris, Metz, Nancy on the A4 highway: take the A86 highway toward Créteil and Versailles, take exit for Créteil Centre D1 and Créteil Centre, Préfecture. At the roundabout, follow signs for Novotel.

Map of the Hotel:



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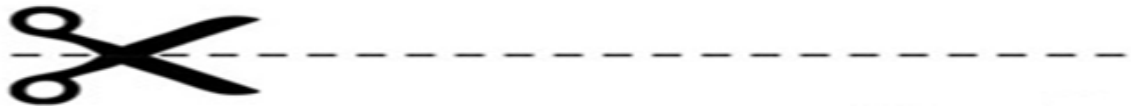
Note



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Presentation and Paper Value					
Registration Process					
Venue					
Food and Beverage					

Are You A Member of HKCBEES	Yes □ No □ (If "No", you may apply membership from http://www.cbees.org/list-34-1.html)
Do You Willing to Receive HKCBEES Future Conferences Information Via E-mail	Yes□ No□
Where did you get the conference information?	
Would you please specify the main reason for attending this conference?	
Did the conference fulfill your reason for attending?	Yes– Absolutely □ Yes- But not to my full extent □ No□ (If "No", please tell us the main reason)

Would you please list the top 3 to 5 universities in your city?	
Other Field of Interest	
Any Other Suggestions/Comments	

Thank you for taking time to participate in this conference evaluation. Your comments will enable us to execute future conferences better and tailor them to your needs! More conference information could be found in http://www.cbees.org/list-15-1.html