Preface

The 2nd International Conference on Kinematics, Mechanics of Rigid Bodies, and Materials 2014 (KINEMATICS 2014), was held at the Sheraton Bandung, Bandung, West Java, Indonesia, , on 29 – 30 November 2014.

The Advances in Mechanical Engineering and Kinematics Sciences give broad influence in Material Sciences, Architecture and Civil Engineering are the order of the day with the rapid industrialization and urbanization seen in developed and developing nations. Innovative design and construction practices are challenging tasks to the architects and engineers to meet the ever growing demands of society.

The conference is the premiere forum for the presentation of new advances and research results in the fields of Mechanical Engineering, Kinematics Sciences in the area of Material Sciences, Architecture and Civil Engineering. The conference will bring together leading researchers, architects, engineers and scientists in this domain of interest from around the world.

The conference has so far been an important event and has attracted many scientists, engineers and researchers from academia, government laboratories, and industry internationally.

We would like to express our sincere gratitude to all in the Technical Program Committee who have reviewed the papers and developed a very interesting Conference Program as well as the invited and plenary speakers.

This year, we received 83 papers and after rigorous review, 14 papers were accepted.

The participants come from 9 countries. There are 4 (Four) Paralell Sessions and one Keynote Speaker and one Workshop Speaker.

It is an honour to present this volume *of Journal of Applied Mechanics and Materials that published by Scientific.net* and we deeply thank the authors for their enthusiastic and high-grade contribution.

Finally, we would like to thank the conference chairmen, the members of the steering committee, the organizing committee, the organizing secretariat and the financial support from the conference sponsors that allowed the success of KINEMATICS 2013.

The Editors of the KINEMATICS 2014 Proceedings Editors

Dr. Ford Lumban Gaol
Dr. Keshav Narain Shrivastava

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Keynote Speaker

1.Fan Sau Cheong

Professor
Division of Structures and Mechanics
School of Civil and Environmental Engineering
College of Engineering

Short Biography:

- Dr Fan Sau Cheong is Professor in Division of Structures and Mechanics, School of Civil and Environmental Engineering, College of Engineering, Nan yang Technology University (NTU). He hold PhD from University of Hong Kong in 1982.
- Dr Fan Su Cheong is 1RSE: Class 1 Registered Structural Engineer (P. R. China) (Since 2008), C.Eng: Chartered Engineer (UK) [since 1987], PE: Professional Engineer (Singapore) [since 1989], FICE: Fellow of the Institution of Civil Engineers (UK) [since 2003], FIStructE: Fellow of the Institution of Structural Engineers (UK) [2002-2010], FHKIE: Fellow of the Hong Kong Institution of Engineers - [since 2004] .
- Dr Fan Sau Cheong is Deputy Director of Centre for Advanced Numerical Engineering Simulations: 1999-2005 and NTU Research Council: 2010-2012.

Title:
Numerical simulation of breakup of concrete magazine due to accidental internal explosion and determination of its debris hazard zone

Abstract:
This talk will give an overview and a summary of the research findings obtained from the study of explosion hazards from Earth Covered Magazine (the ECM project in short). The ECM project is one of the major research projects conducting under the Protective Technology Research Centre of Nanyang Technological University (NTU), Singapore. The main objective of the ECM project is to formulate practical guidelines to predict the hazards from the breakup and the debris generated from above-ground, earth covered magazines due to internal explosion. The ECM project also aimed to develop practical engineering tools (in form of a computer program with user-friendly GUI) for the prediction of Inhabited Building Distance of the ECM. In order to predict and quantify the hazards from internal explosion of ECM, the main research works of this project involves theoretical, numerical and experimental investigations of (1) high strain rate

break up behaviours of reinforced concrete structures and earth cover subjected to internal explosion, (2) intersections of high-speed flying debris with surrounding air and (3) the effect of bounce and ricochet of debris on the final debris dispersion range. In addition, some preliminary studies have also been conducted to explore the possibility to develop a debris trajectory tracing method. The ECM project is a multi-institutional project that involves many research parties including the Defence Science and Technology Agency (DSTA), Singapore, two Schools of NTU (Civil and Environmental Engineering, CEE and Mechanical and Aerospace Engineering, MAE), the Ernst-Mach-Institut (EMI), Germany and Delft University of Technology (TUDelft), Netherlands.

2.Prof. Lin Jianyi

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Energy Research Institute @NTU
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Department of Physics, National University of Singapore (NUS)
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Education:

- Undergraduate study: Department of Chemistry, Xiamen University, 1961-66
- Postgraduate study: Department of Chemistry, Xiamen University, 1978-80
- Visiting Scholar in Chemistry, Bradford University, UK, 1980-83
- PhD in Chemistry, Stanford University, 1985-1991

Career Highlights:

- Principal Scientist at Energy Research Institute @NTU, 14 Feb 2013 -
- ACAR Projects Consultant at ICES, Oct. 2012- 5 Oct. 2014
- Principal Scientist at ICES, Oct. 2004-Oct. 2012
- Most Inspiring Mentor Award (Oct. 2012, ICES)
- Adjunct Professor at NUS since Oct. 2004-
- Faculty Staff at Physics Department, NUS
- Associate Professor (1999-2004), Senior Lecturer (1995-1998); Lecturer (1993-1994),
- Outstanding University Researcher Award (1998/1999, NUS)
- Science Meritorious Teaching Award (1998/1999, Science Faculty, NUS)
- Science Meritorious Teaching Award (1999/2000,Science Faculty, NUS)
- Research Scientist at Chemical Engineering Department, NUS 1991-1994
- Faculty Staff at Chemistry Department, Xiamen University 1972-1985
- 四川化工厂, 1968-1972

Research Interests and Expertise Areas:
Surface science, Heterogeneous catalysis, and Nanomaterials, which include hydrogen production and storage, H_2PEM fuel cell, supercapacitor, and Li-ion battery studies.

39 postgraduates (22 PhD and 17 MSc) and **23** research fellows have been/being advised

260 International journal papers published and 19 patterns filing

Selected 10 papers

1. SIMS study of the formic acid adsorption on Cu and CuCl(111) surfaces, **Surface Science 285 (1993) 31-41**
2. The electronic Structure and Optical Limiting Behavior of Carbon Nanotubes, **Physical Review Letters 82 (1999) 2548-2551**
3. Supercapacitor electrodes from tubes-in-tube carbon nanostructures, **Chemistry of Materials 19, 6120-6125 (2007)**
4. Thickness-Dependent Reversible Hydrogenation of Graphene Layers, **ACS NANO 3(7), 1781-1788 (2009)**
5. One-step synthesis of NH2-graphene from in situ graphene-oxide reduction and its improved electrochemical properties, **Carbon 49, 3250-3257 (2011)**
6. Preparation of Supercapacitor Electrodes through Selection of Graphene Surface Functionalities, **ACS NANO 6, 5941 (2012)**
7. Co3O4/Nitrogen modified graphene electrode as Li-ion anode with high reversible capacity and improved initial cycle performance, **Nano Energy 3, 134 (2014)**
8. Three dimensionals α-Fe2O3/polypyrrole (Ppy) nanoarray as anode for micro lithium ion batteries, **Nano Energy 2, 726 (2014)**
9. One novel and universal method to prepare transition metal nitrides doped graphene anodes for Li-ion battery, **Electrochimica Acta, 134, 28 (2014)**
10. A V2O5/Conductive-Polymer Core/Shell Nanobelt Array on Three-Dimensional Graphite Foam: A High-Rate, Ultrastable, and Freestanding Cathode for Lithium-Ion Batteries, **Advanced Materials 26, 5794 (2014)**.

Title:
The graphene-based Materials and its Application for Energy Storage

Abstract:
Graphene is an advanced material widely studied for energy storage and energy conversion applications. In this presentation N-doped graphene is first used as the non-Pt catalyst for oxygen reduction reaction in H2-O2 fuel cell. The nature of the active center and the reaction mechanism are discussed.
Graphene is also shown to greatly enhance the performance of the graphene/polymer, graphen/Si , graphene/FeN, graphene/MoS2 composites when they
are employed as the electrodes for energy storage in supercapacitor and Li ion battery.

3. Prof. Shengdong Zhao

Assistant Professor in the Department of Computer Science of the National University of Singapore

Short Biography:

Dr. Shengdong Zhao is an Assistant Professor in the Department of Computer Science of the National University of Singapore. He founded the NUS-HCI research lab. Shengdong has a wealth of experience in developing new interface tools and applications, such as earPod, InkSeine, Magic Cards, SandCanvas, Vignette, etc. He is the recipient of the NUS Young Investigator Award in 2009. He earned his Masters and PhD degrees at the University of California at Berkeley and the University of Toronto, respectively. More information about Shengdong can be found at http://www.shengdongzhao.com

Title:
Connecting the Dots – Balancing Humans and Computers

Abstract:
On the surface, Human–computer Interaction (HCI) may appear to be a very broad field without clear focus. There are a great number of HCI researchers from multiple disciplines working on a wide variety of problems that seem to have little connection with each other. However, underneath most of the problems is one underlying principle: how to seek the optimal balance between humans and computers? As our field is rapidly growing, it is easy to get buried in the details and lose sight of the overall vision. In this talk, I will argue that it is imperative that we don't lose sight of this fundamental principle, and will try to illustrate this guiding principle using a number of systems developed in the NUS-HCI lab, including SandCanvas, Vignette, Magic Cards, etc. The talk will end with a discussion of the prospect of human-computer interaction in the future.