

**The Third NEA-JC Annual Workshop on
Current and Future Technologies**

The University of Tokyo, Hongo Campus, 08 November 2009, Tokyo, Japan

Program

Session I: Opening and Keynotes [10:00 – 11:10]

MC: Er. Vishnu Prasad Pandey
Chair: Dr. Ved Prasad Kafle

1. Welcome and opening address by **Dr. Ved Prasad Kafle**, NEA-JC President
2. Key note speech by **Er. Michinori Hanko**, JSCE Representative and former JICA Expert to Nepal
3. Keynote speech by **Dr. Netra Prakash Bhandary**, Assistant Professor, Ehime University, Japan

Session II: Opening Plenary [11:10 – 12:30]

Theme: How can the research community in Japan work collectively and establish a right communication channel with policy makers in Nepal to contribute to the development of Nepal.

Panelist: Dr. Surya Raj Acharya, Dr. Netra Prakash Bhandary, Dr. Bhuwaneshwar Sah.

Lunch Break [12:30 – 14:00]

Session III: [Chair: Dr. Jhabindra Prasad Ghimire] [14:00 – 15:40]

1. **Speaker:** Er. Netra Gyanwali, PhD Scholar, Kyoto University
Title: Control strategies of a hybrid microgrid
2. **Speaker:** Er. Vishnu P. Pandey, PhD Scholar, University of Yamanashi
Title: Estimation of groundwater storage potential of aquifers in Kathmandu Valley using GIS
3. **Speaker:** Er. Kabir Shakya, PhD Scholar, Tokyo Institute of Technology
Title: Seismic pounding of buildings in a row considering soil-foundation interaction represented by discrete model
4. **Speaker:** Er. Laxmi Prasad Suwal, M.S. Student, University of Tokyo
Title: Development of disk shaped piezo-ceramic plate transducer for elastic wave measurements in laboratory specimens

Coffee Break [15:40 – 15:50]

Session IV: [Chair: Dr. Dinesh Manandhar] [15:50 – 16:50]

1. **Speaker:** Er. Chandi Subedi, Senior System Engineer, SoftBank Corporation
Title: Introduction to cloud computing
2. **Speaker:** Er. Kamal Adhikari, CTO, New IT Venture Corporation
Title: Ultimate solution for building next generation network (NGN) and WiMAX for Nepal
3. **Speaker:** Er. Kumar Simkhada, KDDI Corporation
Title: E-voting: possibilities and challenges in the Nepalese context

Concluding remarks [16:50 – 17:00]

Dr. Bhoj Raj Pantha, Co-chair of Organizing Committee

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Presentation summaries and speakers' profiles

Title: Road project policy, road issues and approach to the challenges in Nepal

Speaker: Er. Michinori Hanko,

Summary: Road construction is one of the most important projects to be developed for economic prosperity in Nepal. As for national highways in Nepal, the future goal of road construction is to construct 3 East West Highways and 8 North South Highways. While 80% of planned highway length, about 10,000km, has been developed as of 2009, however, the priority of the road project has now been shifted from road construction to upgrade or maintenance of roads. As the road construction is well facilitated, it is reported that the conditions of opened roads are not in a good shape. In order to improve the functionality of existing roads, roads should be blacktopped more and be maintained appropriately. Traffic jam in Kathmandu valley is another issue to be solved with high priority. This presentation introduces the outline of the present road project policy, road issues to be discussed and future prospects for solving these challenges in Nepal.

Speaker's profile: Er. Hanko has worked for Metropolitan Expressway Company Limited since 1986. He received a Bachelor's degree in Civil Engineering at Kobe University in 1986. He got a Master's degree in Geotechnical Engineering at University of California, Davis in 1997. He has 2 years experience of JICA Road Expert in Nepal from 2007 to 2009.

Title: Geotechnical perspectives of earthquake disaster risk in Kathmandu Valley

Speaker: Dr. Netra Prakash Bhandary

Summary: Kathmandu Valley is a nearly bowl-shaped basin of lake deposit, which currently accommodates approximately 3 million people. Besides ageing of brick masonry structures and non-engineered construction practice, nearly 100m to 700 m of lake deposits consisting of gravelly to clayey layers measuring from a few to several tens of meters in thickness have made Kathmandu Valley one of the most vulnerable places for earthquake disasters. Especially, after geo-scientists and seismologists have predicted that there will be a 1934-scale earthquake (above 8 in Richter scale) in near future, probably within the next 10-20 years, the public as well as government concern has largely gone up. However, lack of proper geotechnical study in the valley has led to inaccurate and misleading risk assessment and damage estimation. A rough estimation based on the past record, made by NSET, predicts that more than 40,000 people will be killed and more than 200,000 people will be injured in Kathmandu Valley alone in case of a big earthquake. These estimated figures may not be inaccurate, but the estimation method does not consider various factors that contribute to earthquake damage, such as ground conditions, structural conditions, etc. So, geotechnical understanding of the lake deposit and its interpretation to damage prediction and disaster risk reduction are of utmost importance in Kathmandu Valley. This paper, therefore, attempts to introduce the basics of earthquake disaster risk in bowl-shaped basin of soft lake deposit, and to discuss a few geotechnical techniques to understand the ground behavior during earthquake motions.

Speaker's profile: Dr. Bhandary is a life member of NEA as well as Member, Japanese Geotechnical Society (Currently Vice President), Member, Japan Society of Civil Engineers, Member, Nepal Geotechnical Society, Member, International Society of Soil Mechanics and Geotechnical Engineering and Alternate Representative (Ehime University), Board of Representative for International Consortium on Landslides. He holds PhD in Engineering (Landslides); 2003 as well as MSc. in Geotechnical Engineering; 2000 from the Ehime University, Japan and B.Sc. in Civil Engineering from Aligarh Muslim University, India. He is presently the Assistant Professor in Graduate School of Science and Engineering, Ehime University, Japan.

Title: Control strategies of a hybrid micro grid

Speaker: Er. Netra Gyanwali

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Summary: Rising environmental concern, recent advances in power electronics and control technology, liberal electric market policy and increased awareness toward sustainable energy solution are favouring to deploy more and more renewable power in electric power industry. Among the renewable power sources, wind power is the most rapidly growing due to its matured, efficient and state-of-art technology with short installation time. At the end of 2007, worldwide nameplate capacity of wind-powered generators was 94.1 GW, which is fivefold global growth between 2000 and 2007. In several countries it has achieved relatively high levels of penetration, accounting for approximately 19% of electricity production in Denmark, 9% in Spain and Portugal, and 6% in Germany and the Republic of Ireland in 2007 [Wikipedia]. However, the intermittent nature of the generated power due to ever changing nature of wind velocity is main challenge for its development. Because of this reason, the wind power alone cannot provide the varying load demand in stand-alone mode, and often create instability, voltage flicker and sporadic tripping problem to the upstream power network in grid connected mode. In either case, the need of reliable storage system is inevitable. The storage system in renewable power system has multiple applications; (i) long term storage for energy management, (ii) medium term storage for frequency regulation and peak shaving, and (iii) short-term/buffer application for power balance and power smoothening. The choice of storage system may be decided by the cost and the mode of operations. For instances, in grid connected mode buffer storage is sufficient since the available power is directly fed to the system. However for stand-alone mode, long term and buffer storage are fundamentally required. In this context, this study addresses the control and operational issues for a stand-alone hybrid system containing WPG, FC and UC and Electrolyzer (ELZ) system. WPG system is operated in maximum power point tracking (MPPT) mode which enables to extract optimum available power from the wind, whereas FC is operated to supply the deficit power in long term and steady state conditions. The UC is responsible for the transient load mitigation of the system during rapid load changing and fault. In this case, the UC is connected to the variable dc bus without bi-directional converter thus relaxing the system with additional burden of the converter and controller associated with UC interface. Likewise, the ELZ is operated to produce H₂ when there is surplus of power, which can effectively reused by SOFC during the power deficit.

Speaker's profile: Er. Gyawali received BE and ME degree in electrical engineering from IOE Tribhuvan University, Nepal and Kyoto University, Japan in 1999 and 2008 respectively. He had joined IOE in 2001 as a lecturer where he worked until 2005. He is member of Nepal Engineering Association (NEA), Engineering council Nepal, and IEEE power & energy society. Currently he is doctoral student of electrical engineering in Kyoto University. His research interests include power electronics applications, renewable and alternative energy, distributed energy resources, micro-grid, and energy storage technology.

Title: Estimation of groundwater storage potential of aquifers in Kathmandu Valley using GIS

Speaker: Er. Vishnu Prasad Pandey

Summary: Groundwater is a major source of water supply in Kathmandu Valley, the capital city of Nepal. Groundwater extraction from the valley's aquifers has already exceeded the recharge since mid-1980s and the gap between extraction and recharge is continuously widening; however, management interventions are yet to be imposed. Any management decisions would be based on detail understanding of hydrogeological characteristics, storage capacity of the aquifers, groundwater flow characteristics, etc. To assist in groundwater management decisions, this study estimates the groundwater storage potential of aquifers in Kathmandu Valley using available secondary data with the help of GIS technique. Results show that shallow and deep aquifers can store 1,452.25 MCM (range: 0 to 6,829.8 m³) and 572.21 MCM (range: 6.9 to 5,233.5 m³) groundwater respectively, at maximum. Assuming future extraction level as same as in 2001, i.e. 21.56 MCM/year, the total storage in the valley's aquifers can fulfill the groundwater demand for next 93.9 years.

Speaker's profile: Mr. Pandey is currently a PhD student in University of Yamanashi. He received Diploma and Bachelor in Civil Engineering from IOE Pulchowk Campus, Tribhuvan University, Nepal in 1999 and 2004 respectively; and got ME in Water Engineering and Management from Asian Institute of Technology (AIT), Thailand in 2007. He worked as a Civil Engineer in Rural Reconstruction Nepal (RRN) for a development project for few months before joining AIT; and as a Research Associate in AIT before joining PhD. He is currently working on modeling of groundwater resources in the Kathmandu Valley to assess the impact of climate and land use change on groundwater resources. He has contributed few articles related to water resources in Nepalese river basins.

Title: Seismic pounding of buildings in a row considering soil-foundation interaction represented by discrete model

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Speaker: Er. Kabir Shakya

Summary: Structural pounding between three buildings in a row, where a 8-story building is located between two 6-story exterior buildings which are identical, are investigated using the finite element analysis software SAP2000. Soil-structure interaction is incorporated by including appropriate mass-spring-damper systems at the foundation level. Energy dissipation during collisions is considered by using a gap element together with a link element with both stiffness and viscous damping properties. Two near field earthquakes and two far field earthquakes are considered for input motions. For the earthquake inputs used in this study, results obtained indicate that buildings are more vulnerable to near field earthquakes. The taller building has relatively large shear amplification factors.

Speaker's profile: Mr. Shakya is currently a PhD student at Department of Civil Engineering, Tokyo Institute of Technology. He completed his Diploma and Bachelor in Civil Engineering from IOE Pulchowk Campus, Tribhuvan University in 1998 and 2004 respectively. He obtained MSc. in Structural Engineering from the same university in 2006. In 2008 he completed M.E. in Civil Engineering from Tokyo Institute of Technology. He has also engaged in design, construction and supervision of numerous residential, commercial buildings, hospital buildings and institutional buildings during 1998 to 2006. He is currently involved in research work for the optimization of reinforcements at beam-column joints of bridges by using steel fiber reinforced concrete.

Title: Development of disk shaped piezo-ceramic plate transducer for elastic wave measurements in laboratory specimens

Speaker: Er. Laxmi Prasad Suwal

Summary: The initial tangent modulus of geo-material is also known as the small strain stiffness modulus of geo-material. It is the mostly used parameter in geotechnical engineering. Recently, many people are conscious about the deformation or settlement of structures. In calculation of deformation/settlements, the small strain stiffness parameters are mostly used. So many researchers are interested on measurement of these parameters and being involved on experiments. This study was made to develop a new plate transducer for Elastic wave measurement. This can adopt on measurement of P-wave as well as S-wave on single specimen. A disk shaped PS-type plate transducer was developed at the laboratory of IIS. A series of tests are conducted applying this plate transducer to know the performance on two granular materials.

Speaker's profile: Laxmi Prasad Suwal is residence of Bhaktapur, Nepal. He had studied Bachelor's degree in Civil Engineering at Pulchowk Campus, Institute of Engineering. He has professional experiences in engineering field. He had worked as Junior Engineer for two years in Okhaldhunga and Sindhupalchowk district. After undergraduate study, He was involved in Khwopa Engineering College, Bhaktapur as a civil engineer as well as academic activities. He further extended his experiences on Design cell Pvt. Ltd, which is one of well known Engineering consultancy in Nepal. Now, He is studying Master's degree in the University of Tokyo.

Title: Introduction to cloud computing

Speaker: Er. Chandi Subedi

Summary: Cloud computing has been a hot topic recently in the Japanese IT market. It is said that there are more than 1,000 definitions of cloud. This presentation describes the concept of cloud computing in an introductory level; and then shows the benefits cloud computing can provide to the users; and mention about the virtualization technology supporting the cloud computing.

Speaker's profile: Er. Chandi Subedi received the bachelor degree in information technology in computational informatics from Chiba University in 2002. He then received the MS in information technology from the same university, majoring in Internet security. His master's thesis was about a verification system of authentication protocols. Er. Subedi has been working for SoftBank Corporation for last six years. He is an expert in security services such as the PKI platform and Radius authentication services. He has developed many ASP/PHP based web systems, e.g., order managing system. He is currently associated with the cloud service development department. Er. Subedi is an MCPC Japan certified first grade mobile system engineer.

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Title: Ultimate solution for building next generation network (NGN) and WiMAX for Nepal

Speaker: Er. Kamal Adhikari

Summary: The presentation includes technology trends for internet solutions, concept behind Next Generation Network (NGN), integration of three service components (i.e. internet broadband, Multimedia Television, and Telephony), challenges for high speed broadband in Nepal, need of localizing the contents for the betterment of high speed internet access, Fusion of WiMAX and WiFi, and finally highlights on different business model to implement NGN.

Speaker's profile: Er. Adhikari is the Director (CTO) of New IT Venture Corporation, Japan. His past experiences include VLSI Design Engineer on CSRDC-CSRL; lecturer in Engineering Colleges under Tribhuva University and Pokhara University in Nepal; technical consultant in E-network Research and Development, Kathmandu; senior engineer in Mola Inc, Tokyo; etc. He completed his BE and ME from Visvesweraiah Technological University, Karnataka, India; and post graduate research in Tokyo University.

Title: E-voting: possibilities and challenges in the Nepalese context

Speaker: Er. Kumar Simkhada

Summary: With the recent advances in the modern technology, typically in the networking field, "e-voting" is emerging as an attractive option over traditional balloting. Traditional paper balloting requires cumbersome manual work, a huge budget, and a substantial amount time for the overall election process. In contrary, e-voting, a faster and more economical approach, can be effective alternative in countries like Nepal where the infrastructure is poor and the population highly dispersed. This presentation discusses the potential of e-voting in the context of Nepalese society, both in and out of the country. It showcases the pros and cons of this state-of-art technology; the core issues being security and scalability. Also presented is the author's experience with the implementation of e-voting software during the election in a Nepali organization. The presentation ends by highlighting some of the most prominent issues that need to be addressed in the Nepalese context-education, infrastructure-building, and policy-making.

Speaker's profile: Er. Simkhada received his BE degree in Information Engineering and MS degree in Computer Network Security, from Tohoku University, in 2005 and 2007 respectively. His publications include several articles on Network Security in journals and IEEE conferences proceedings. He is the editor of a Nepali literary book and a reviewer of several journals and conference papers. He runs non-profitable web portals whose scope range from community forums to literature. He is currently with the KDDI Corporation, specializing in development and management of applications and databases in distributed environments.

Note: *Proceedings will be available on <http://www.neajc.org/> after the workshop.*

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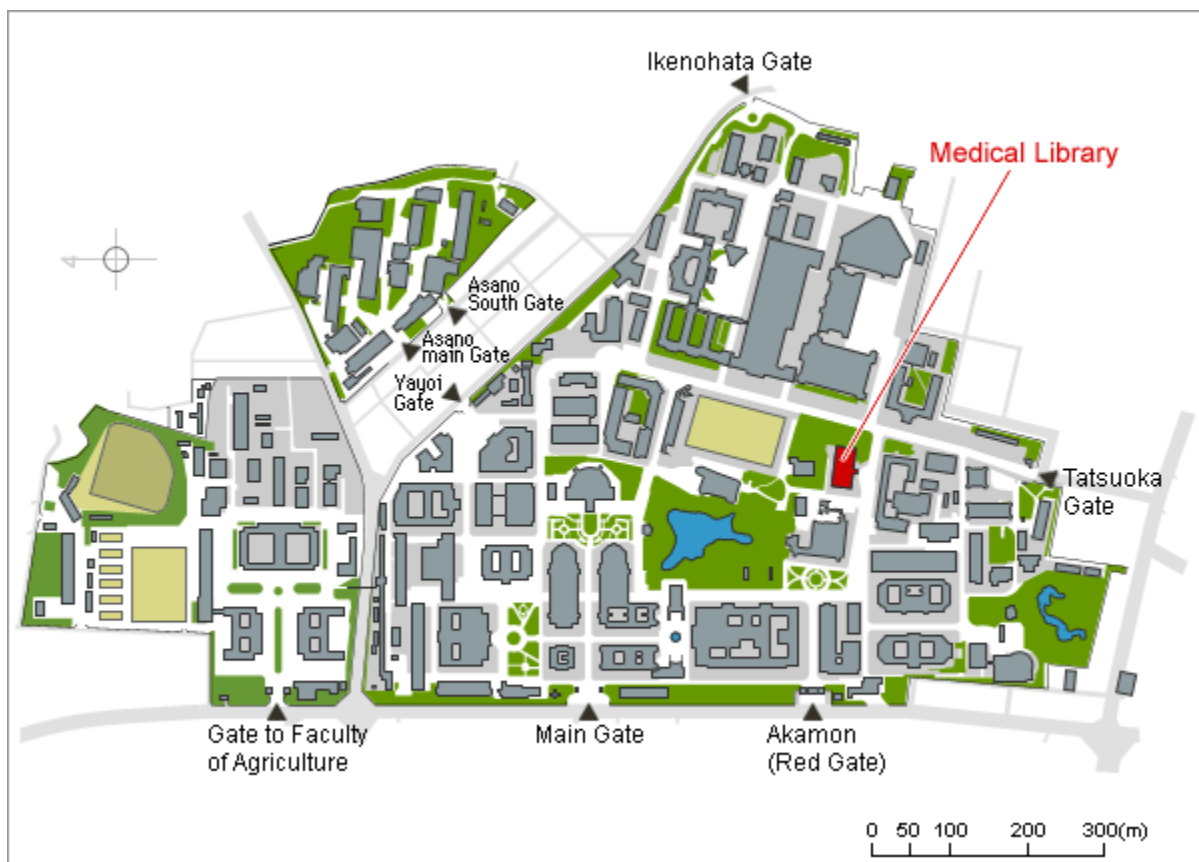
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Program venue

Hall # 333, 3F of the Medical Library,
The University of Tokyo, Hongo Campus,
Tokyo, Japan

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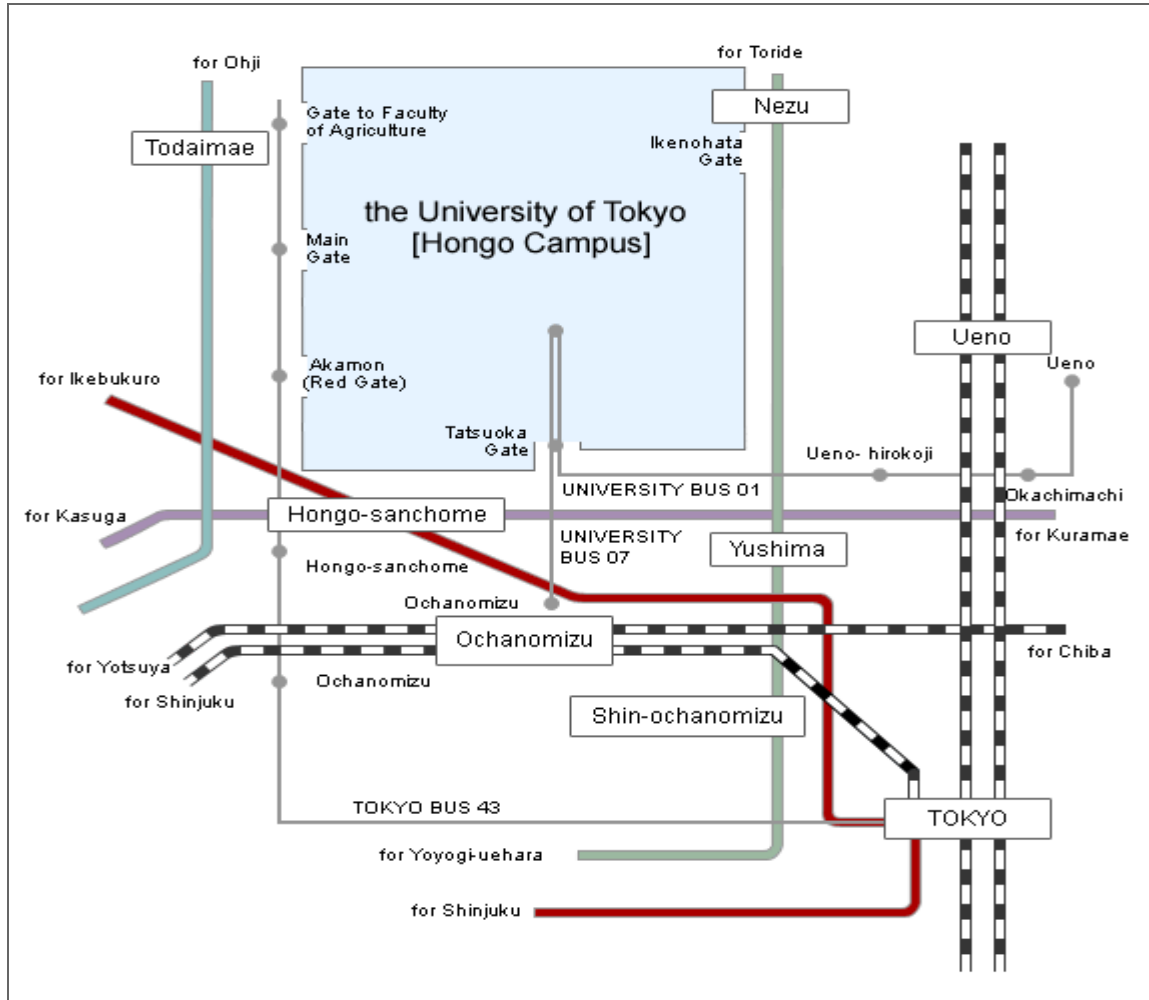
Access Map:



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Hongo Campus Access Map:



Nearest Stations	Distance from Sta.
Hongo-sanchome Station. (Subway Marunouchi Line)	8 min. walk
Hongo-sanchome Station. (Subway Oedo Line)	6 min. walk
Yushima Station. or Nezu Station. (Subway Chiyoda Line)	8 min. walk
Todaimae Station. (Subway Namboku Line)	1 min. walk
Kasuga Station. (Subway Mita Line)	10 min. walk