

Event Summary

The fifth edition of IOE Graduate Conference was organized by Center for Applied Research and Development (CARD), one of the research centers of the Institute of Engineering (IOE), Tribhuvan University, Nepal. The conference was held at the premises of Department of Architecture and Urban Planning, Pulchowk Campus on December 29 and 30, 2017.

There were altogether eighty-three presentations, including twenty-three poster presentations by graduate students, researchers and professionals. The oral presentations were made in three parallel tracks with three sessions each, thus comprising nine sessions with a total of sixty papers. In addition to the plenary papers and regular posters with reflecting research works on different streams of engineering, the motivational keynote speech with amalgamation of phenomenal research work and pioneering technology build on “Assistive Technology for the Visually Impaired: ASSISTECH” by Prof. M. Balakrishnan, Deputy Director, IIT- Delhi, turned out as one of the prime epitomes of the conference.

Looking beyond numbers, as they cannot express the atmosphere of the conference, we should state that, in accordance with the conference theme, the participants were tremendously active. We are thankful to the referees, session chairs, authors/presenters, audience and volunteers for such interesting, inspiring and fruitful sessions.

Each of the papers were reviewed by independent reviewers before the conference. We are very indebted to all the experts who were willing to spend their time, energy and experience for the wonderful review work. Moreover, in some cases the papers were amended and reviewed a second time. The reason why we did not make just a simple accept / don't accept process was simple: we wanted the Proceedings to reflect as much as possible of what was presented and discussed at the conference. So we preferred to offer the authors the possibility to improve their papers, even though this meant a greater workload to reviewers and editors.

Finally, there are the eighty-three accepted papers from oral/poster presentations published in this Proceedings. The topics and other characteristics of these papers form a rather complex mosaic. However, we have presented them in the form of mixed ideas ordered with the surname of the first author. We are aware of the fact that some papers may be rather local and, as such, could not be published for example, in research journals. However, such activities form a part of a broader area that fits under the philosophy of “Active Learning.” These activities can be inspiring for some readers and therefore deserve being published in the Proceedings, as it aims to cover the broad spectrum of contributions presented at IOE Graduate conference 2017. We hope that this publication will provide you, the reader, the opportunity to get acquainted in greater detail with the ideas and results of the conference participants and also, perhaps, to recall some of the friendly and inspiring atmosphere of the event.

Finally, we are very grateful to everyone involved for the overall success of the event.

Working Committee
IOEGC-2017

Working Committee

Prof. Binod Kumar Bhattarai <i>Department of Applied Sciences</i>	Convener
Prof. Gokarna B. Motra – Member <i>Campus Chief, Pulchowk Campus</i>	Member
Prof. Sudha Shrestha <i>Department of Architecture and Urban Planning</i>	Member
Bharat Mandal, PhD <i>Department of Civil Engineering</i>	Member
Laxman Paudel, PhD <i>Department of Mechanical Engineering</i>	Member
Mohammad Badrudoja <i>Department of Electrical Engineering</i>	Member
Diwakar Raj Pant, PhD <i>Department of Eletronics and Computer Engineering</i>	Member
Arun Kumar Timalisina, PhD <i>Center for Applied Research and Development</i>	Member
Nawaraj Bhattarai, PhD <i>Department of Mechanical Engineering</i>	Member
Jayandra Raj Shrestha <i>Department of Applied Sciences</i>	Member
Pramod Niraula <i>Center for Applied Research and Development</i>	Member Secretary

Contents

Papers from Oral Presentations

1. Analysis of Open Circular Reinforced Concrete Shell Roof with Curved Edge Simply Supported ... 1
 - *Abhishek Adhikari, Hikmat Raj Joshi*
2. Difference Between User Experience in Implementation of Redirected Walking in Referenced Environment and Unreferenced Environment ... 7
 - *Ashu Adhikari, Sujal Dhungana, Shashidhar Ram Joshi*
3. Impact of Renewable Energy Subsidy Policy in Rural Electrification ... 15
 - *Madhusudhan Adhikari, Bharat Raj Pahari, Rajendra Shrestha*
4. Performance Analysis of Solar PV System of Teaching Hospital, Kathmandu, Nepal ... 23
 - *Ashok Aryal, Nawraj Bhattarai*
5. Improved Salient Object Extraction using Structured Matrix Decomposition and Contour Based Spatial Prior ... 31
 - *Ramesh Bhandari, Sharad Kumar Ghimire*
6. Effect of Column-to-Beam Moment Capacity Ratio on Seismic Performance of Reinforced Concrete Moment Resisting Frames ... 39
 - *Sujan Bhandari, Hari Darshan Shrestha*
7. Integrated Roadside Vegetation Management along the Highways of Nepal ... 49
 - *Shubhechchha Bhatta, Narendra Man Shakya, Udo Nehren*
8. A Tri-channel Active Electrode EEG Device for Classification of Motor Imagery Brainwaves ... 57
 - *Saroj Bista, Nanda Bikram Adhikari*
9. Mathematical Modeling for the Design of Francis Runner ... 67
 - *Indra Bahadur Biswakarma, Rajendra Shrestha*
10. A Study of Effect of Filler Contents and Filler Types in Marshall Stability and Flow Value in Asphalt Concrete ... 75
 - *Niraj Bohara, Prof. Gautam Bir Sing Tamrakar*
11. Performance Evaluation of Hydro Power Plants of Nepal Greater Than 10 MW Using Data Envelopment Analysis ... 87
 - *Sapana Bohara, Rajendra Shrestha*
12. Energy Recovery Potential from Spent Grains in Breweries of Nepal ... 93
 - *Jainendra Chaudhary, Nawraj Bhattarai*
13. Implementation of Decision Engineering Tool on International Destination Selection in Aviation: A Case of Nepal Airlines Corporation ... 99
 - *Krishna Prasad Gaihre, Shree Raj Shakya*
14. Effect of Grounding Resistance and Lightning Arrester Non-linear Characteristics in Electrical Distribution System ... 107
 - *Mukesh Gautam, Arbind Kumar Mishra*

15.	Energy Demand and Emissions Mitigation Potential of Mass Transportation Vehicle: A Case Study of Ring Road Kathmandu Valley	... 113
	• <i>Prativa Gautam, Nawraj Bhattarai, Iswor Bajracharya</i>	
16.	Infinite Server Queueing Model with State Dependent Arrival and Service Rates	... 119
	• <i>Sushil Ghimire, Gyan Bahadur Thapa, Ram Prasad Ghimire</i>	
17.	Analysis of Nepal's Long Term Electricity Demand Using End Use Methodology	... 125
	• <i>Manjana Ghimire, Nawraj Bhattara</i>	
18.	Concept of Urban Renewal and Its Suitability to Kathmandu	... 129
	• <i>Subid Ghimire</i>	
19.	Urge of New Town: Energy Resilient Urban Morphology	... 137
	• <i>Akansha Gupta, Sangeeta Singh</i>	
20.	Comparative Study of Gravel and Anthracite as Media in Up flow Filter	... 147
	• <i>Ravi Chandra Joshi, Iswar Man Amatya</i>	
21.	Reinforcement of Soil Using Recycled Polyethylene Terephthalate (PET) Bottle Strips	... 153
	• <i>Rashik Karmacharya, Indra Prasad Acharya</i>	
22.	A study on the Practice of Implementation of Quality Assurance Plan in Nepal: A case study in Department of Roads	... 157
	• <i>Sanjay Kasula, Gautam Bir Sing Tamrakar, Vishnu Prashad Shrestha</i>	
23.	Effect of Pulse Charging in Lead acid Batteries Used in Electric Vehicles of Nepal	... 165
	• <i>Ram Raj Khanal, Rajesh Kaji Kayestha</i>	
24.	Stability Analysis of Cut-slope: A case study of Kathmandu-Nijghad Fast track	... 171
	• <i>Gopal Kharel, Indra Prasad Acharya</i>	
25.	Design, CFD Analysis, Fabrication, Testing and Efficiency Evaluation of Low Head Pico-Propeller turbine Without Guide Vanes	... 175
	• <i>Manish koirala, Bipin Tiwari, Mukunda Khanal, Pradip pathak , Rajkumar Chaulagain</i>	
26.	Seismic Vulnerability and Earthquake Losses of RC Frame Buildings of Kathmandu City Core	... 187
	• <i>Sudeep Lamsal, Prem Nath Maskey</i>	
27.	Object Detection in Images using Region Based CNN	... 195
	• <i>Deepesh Lekhak, Basanta Joshi, Sushma Shrestha</i>	
28.	Indoor Odometry and Point Cloud Mapping	... 203
	• <i>Prabhat Sanu Ligal, Bikram Acharya, Pradeep Bajracharya, Prasun Shrestha, Pratik Pokharel, Sharad Kumar Ghimire</i>	
29.	Effect of Aggregate Gradation Variation on the Marshall Mix Properties of Asphalt Concrete	... 213
	• <i>Rajendra Maharjan, Gautam Bir Sing Tamrakar</i>	
30.	Optimal PV Inverter Reactive Power Control and Real Power Curtailment to Improve the Performance of Low Voltage Distribution System	... 221
	• <i>Sunil Kuamr Mahto, Netra Prasad Gyawali</i>	

31.	Free Vibration Analysis of Selected Pelton Turbine using Dynamic Approach	... 229
	• <i>Laxman Motra, Mahesh Chandra Luintel</i>	
32.	Earth as Building Material for Sustainable Development: Case from Jhong, Mustang	... 237
	• <i>R.M. Pandey, Sudarshan Raj Tiwari, Sushil B. Bajracharya</i>	
33.	Effect of Location of Opening on the Infilled Reinforced Concrete Frame	... 245
	• <i>Umesh Patel, Bharat Mandal</i>	
34.	Ontology based Job-Candidate Matching using Skill Sets	... 251
	• <i>Subhash Paudel, Aman Shakya</i>	
35.	Analysis and Optimization of Magnetic Resonant Wireless Power Transfer System	... 259
	• <i>Ashutosh Timilsina, Beni Nepali, Binay Paudyal, Jenesha Kunwar, Arbind Kumar Mishra, Sharad Kumar Ghimire</i>	
36.	Assessment to Identify the Techno-economic and Sustainable Hybrid Energy Model for Remote Area of Nepal	... 267
	• <i>Narayan Prasad Poudel, Shree Raj Shakya</i>	
37.	Design, Fabrication and Testing of Waste Plastic Pyrolysis Plant	... 275
	• <i>Ajay Jayswal, Arbind Kumar Sah, Prabin Pradhananga, Rohit Sah, Hari Bahadur Darlami</i>	
38.	Driving factors of Energy consumption in Transport Sector	... 283
	• <i>Anita Prajapati, Tri Ratna Bajracharya, Nawraj Bhattarai</i>	
39.	Study of Rainfall Thresholds for Landslide in Soil Slopes Based on Numerical Modeling	... 291
	• <i>Sapath Rajbhandari, Indra Prasad Acharya, Ranjan Kumar Dahal</i>	
40.	Performance Evaluation of Micro-hydro projects in Nepal using multi criteria decision analysis(MCDA	... 299
	• <i>Ramesh Ranabhat, Laxman Poudel, Shree Raj Shakya</i>	
41.	Design, Fabrication and Testing of Hydraulic Ram Pump with Water Recirculation System	... 305
	• <i>Bibek Sapkota, Gopal Pandey, Utsav Kharel, Raj Kumar Chaulagain</i>	
42.	Using Logistic Regression to Estimate the Influence of Crash Factors on Road Crash Severity in Kathmandu Valley	... 311
	• <i>Rajeeb Shakya, Anil Marsani</i>	
43.	A Strain-Based Fatigue Damage Model for Woven Fabric Composites	... 325
	• <i>Sajan Shakya, Kamal Bahadur Thapa</i>	
44.	Comparative Study of Gaseous and Particulate Emissions from Traditional and Modified Charcoal Production Kilns	... 331
	• <i>Dipak Sharma, Rudra Mani Ghimire</i>	
45.	A Qualitative and Quantitative Analysis of the Political Discourse on Nepalese Social Media	... 337
	• <i>Mandar Sharma, Dinesh Baniya Kshatri</i>	

46.	A Novel Approach to Traffic Sign Localization and Recognition Based on Single Shot Multibox Detector	... 343
	• <i>Sushma Shrestha, Sanjeeb Panday, Deepesh Lekhak</i>	
47.	A Housing Morphology: For the case of proposed Panchkhal Smart City	... 351
	• <i>Anjana Shrestha, Sushil B. Bajracharya, Shree Raj Shakya</i>	
48.	Exploring Smart Rural Planning at Jhong, Mustang: A Step towards Sustainable Development	... 361
	• <i>Niranjan Shrestha, Martina M. Keitsch, Sangeeta Singh</i>	
49.	Numerical Simulation of Masonry Walls Through Inclusion of Interface Elements	... 371
	• <i>Pradhyumna Shrestha, Hari Ram Parajuli</i>	
50.	Sustainable Design and Thermal Comfort Strategy: Cases of Urban “Affordable Housing” in Nepal	... 379
	• <i>Pratiksha Shrestha, Sushil Bahadur Bajracharya</i>	
51.	Performance Improvement of a Signalized Intersection(A Case Study of New Baneshwor Intersection)	... 389
	• <i>Sakar Shrestha, Anil Marsani</i>	
52.	Assessment of Building Envelope Materials for Sustainable Private House Reconstruction(A Multi-Criteria Decision Analysis for case of Dhoksan)	... 397
	• <i>Parikshya Singh, Amrit Man Nakarmi, Sangeeta Singh</i>	
53.	Solar PV Pumping Technology for the development of Agriculture in Mustang, Nepal (A case study of Tiri, Kagbeni)	... 405
	• <i>Sujita Thakali, Shree Raj Shakya</i>	
54.	Optimal Reactive Power Control for Distribution Network Loss Reduction	... 419
	• <i>Roshani Thapa, Arvind Kumar Mishra</i>	
55.	Seismic response of RC frame building with soft first storey considering Soil Structure Interaction	... 427
	• <i>Sajak Thapa</i>	
56.	Performance Evaluation of Francis Turbine using thermodynamics analysis: A Case Study of Kali Gandaki A Hydropower Plant-144 MW	... 431
	• <i>Shiva Kumar Thapa, Laxman Poudel</i>	
57.	Passive solar approaches for New Town Development: A case at Baireni-Galchhi (400-500)	... 439
	• <i>Prerana Tuladhar, Sudarshan Raj Tiwari, Sushil Bahadur Bajracharya</i>	
58.	Effectiveness of Bracing on RC Moment Resisting Frame Building	... 449
	• <i>Rabindra Upreti, R. K. Mallik</i>	
59.	The relationship between Los Angeles Abrasion Value and Thickness of Base Course of different aggregate samples of Nepal	... 453
	• <i>Sashank Uprety, Gautam Bir Singh Tamarakar</i>	
60.	Hazard Contamination Control Behavior Practice of Puff Industry: A Case Study of Puff Unit of Khajorico Pvt. Ltd. Chapagaun Lalitpur, Nepal	... 459
	• <i>Sanjib Kumar Yadav, Rajesh Kaji Kayastha</i>	

Papers from Poster Presentations

61. Trend Analysis of Technology News in Nepali Newspapers. A case study: The Kathmandu Post ... 469
 - *Slesa Adhikari, Arun Kumar Timalsina*
62. Study on Grid Integrated Solar PV for Balaju Industrial District, Kathmandu, Nepal ... 475
 - *Rajendra Prasad Bhattaa, Nawraj Bhattarai*
63. Estimation of Technical and Non-Technical Losses of an 11kV Industrial Feeder: A Case study ... 481 in Kawasoti Distribution Centre
 - *Trilochan Bhattarai, Shree Raj Shakya*
64. Reliability Evaluation of Gaighat Radial Distribution Feeder with Distributed Generation ... 489 Impacts
 - *Anil Kumar Chaudhary, Ajay Kumar Jha*
65. Energy Efficiency Improvement Potential of Dairy Development Corporation: Kathmandu ... 497 Valley Milk Supply Scheme
 - *Sudhir Bahadur Joshi, Laxman Poudel*
66. Seismic Performance of Long Span Open Spandrel Concrete Arch Bridge ... 505
 - *Ashish Karki, Bharat Mandal, Bijaya Jaishi*
67. Dynamic Response of Pelton Turbine Unit for Forced Vibration ... 509
 - *Sanjeev Karki, Mahesh Chandra Luintel, Laxman Poudel*
68. Design Strategies to Energy Efficient Building in Kathmandu Valley -A Case Study of CES-Zero ... 519 Energy Building at Institute of Engineering
 - *Sundar Lakhe, Bharat Raj Pahari, Shree Raj Shakya*
69. Design and Numerical Analysis of Solar underfloor Heating System : A Case Study of Resort in ... 529 Nagarkot, Nepal
 - *Sarika Kumari Mishra, Tri Ratna Bajracharya, Rabindra Nath Bhattarai*
70. Performance Evaluation of 18kW Solar Photovoltaic Baidi MicroGrid at Baidi, Tanahun, Nepal ... 537
 - *Sanjaya Neupane, Ajay Kumar Jha*
71. Seismic Vulnerability of RC Frame Buildings non complying with MRT based on Slenderness ... 543 Ratio and Plan Aspect Ratio
 - *Bipul Poudel, Siddharth Shankar*
72. Socio-Economic Assessment of Solar Irrigation System in Saptari, Nepal ... 549
 - *Bal Ram Raut, Amrit Man Nakarmi, Sangeeta Singh*
73. Grid Integration Studies of Captive and Cogeneration Plant in Sugar Industry: Case Study of ... 559 Indushankar Sugar Industry Pvt. Ltd.
 - *Sanjeev Ray, Ajay Kumar Jha*
74. Understanding Technology Adoption: A Case of ICS in Sindhupalchowk, Nepal ... 569
 - *Sagar Regmi, Sushil B. Bajracharya, Martina M. Keitsch*

75.	Vertical Acceleration in Network Tied Arch Bridge due to Moving Vehicle	... 577
	• <i>Ravi Shah, Bharat Mandal, R. K. Mallik</i>	
76.	Analysis of Landslides and Slopes (Nepalthok-Khurkot section) using SVSLOPE model and Remediation using Soil Nail	... 581
	• <i>Ojaswi Sharma, Indra Prasad Acharya</i>	
77.	Uprating of Existing Transmission Lines in Nepal Using High Capacity Conductors	... 589
	• <i>Saroj Shrestha, Ajay Kumar Jha</i>	
78.	Experimental Performance Analysis of Solar Conduction Dryer (SCD) for Ginger drying	... 597
	• <i>Tek Raj Subedi, Rabindra Nath Bhattarai</i>	
79.	Energy Integrated in Rural Reconstruction: A Case at Laprak, Dharche Rural Municipality-4, Gorkha	... 603
	• <i>Rukesh Suwal, Sudarshan Raj Tiwari, Sangeeta Singh</i>	
80.	An Approach to Extract Features of Mammography Images for Early Detection of Breast Cancer	... 613
	• <i>Ujjwal Thapa Magar, Dibakar Raj Pant</i>	
81.	Impact of Traffic Bottleneck on Urban Road: A Case Study of Maitighar-Tinkune Road Section	... 623
	• <i>Amit Prasad Timalsena, Anil Marsani, Hemant Tiwari</i>	
82.	Performance analysis of a 100 kWp grid connected Solar Photovoltaic Power Plant in Kharipati, Bhaktapur, Nepal	... 629
	• <i>Bhoj Raj Tiwari, Nawraj Bhattarai, Ajay Kumar Jha</i>	
83.	Framework to assess sustainability of micro-hydro projects in the Operation Phase	... 637
	• <i>Sudiksha Uprety, Brijesh Mainali, Shree Raj Shakya, Ram Prasad Dhital</i>	

Technical Sessions

Session	Theme	Session Chair	Papers Presented (SN)
Track I (Day 1 - Dec 29, 2017)			
A1	Poster Presentations		61 to 83
Track II (Day 1 - Dec 29, 2017)			
A2	Structure	Dr. Bharat Mandal	1, 6, 26, 33, 49, 55, 58
B2	Hydraulic Machines	Dr. Laxman Paudel	9, 11, 25, 31, 40, 41, 56
C2	ICT	Dr. Basanta Joshi	2, 5, 16, 27, 28, 34, 45, 46
Track III (Day 2 - Dec 30, 2017)			
A3	Electrical / Electronics	Dr. Dibakar Raj Pant	4, 8, 14, 30, 35, 54
B3	Geology / Transportation / Environment	Dr. Indra Acharya	10, 20, 21, 24, 39, 43
C3	Energy and Environment - I	Dr. Shreeraj Shakya	3, 12, 15, 36, 44, 53
Track IV (Day 2 - Dec 30, 2017)			
A4	Energy and Environment - II	Dr. Ajay Kumar Jha	13, 17, 23, 37, 38, 53, 60
B4	Infrastructure Planning	Prof. Sudha Shrestha	19, 32, 47, 48, 50, 52, 57
C4	Transportation / Urbanization	Dr. Basanta Raj Adhikari	7, 18, 22, 29, 42, 51, 59

Best Poster Awards

As a motivation to poster presenters, following four among the twenty-three poster presentations were awarded as “Best Posters” on different categories:

- **Best Poster in Application**

- Design and Numerical Analysis of Solar underfloor Heating System : A Case Study of Resort in Nagarkot, Nepal
Sarika Kumari Mishra, Tri Ratna Bajracharya, Rabindra Nath Bhattarai

- **Best Poster in Content**

- An Approach to Extract Features of Mammography Images for Early Detection of Breast Cancer
Ujjwal Thapa Magar, Dibakar Raj Pant

- **Best Poster in Design**

- Trend Analysis of Technology News in Nepali Newspapers. A case study: The Kathmandu Post
Slesa Adhikari, Arun Kumar Timalsina

- **Best Poster in Presentation**

- Seismic Performance of Long Span Open Spandrel Concrete Arch Bridge
Ashish Karki, Bharat Mandal, Bijaya Jaishi