SAJAN K C

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EDUCATION

Ph.D. in Civil Engineering **08/2022 – Present**
University of Southern California, Los Angeles, California
Advisor: Chukwuebuka C. Nweke Grade: 4.0/4.0

Bachelor of Civil Engineering **11/2015 – 11/ 2019**
Pulchowk Campus, Institute of Engineering, Tribhuvan University

- Electives: Structural Dynamics, Earthquake Resistant Design of Structures & Time Series Analysis

RESEARCH EXPERIENCE

1. Reconciling Bias in Moderate Magnitude Earthquake Ground Motions Predicted by Cybershake Simulations
   Project supervisors: Chukwuebuka C. Nweke (USC), Robert W. Graves (USGS), Jonathan P. Stewart (UCLA)
2. *Earthquake Early Warning in Nepal* *(Collaboration between Pulchowk Campus and Duke University)* **05/2019 – 07/2022**
   Student Researcher (Leader of the Attenuation team)
   - Test various methods to detect P-wave and its parameters using KNET & KiK-NET seismic ground motion data.
   - Develop statistical models, including machine learning and deep learning, to predict peak ground acceleration/velocity for onsite and regional earthquake warning systems using Matlab and Python.
   - Weekly Skype call with Prof. Henri P. Gavin (PI of the project) for research work update.
   - Assist Prof. Gavin in extending collaboration with various stakeholders of early warning in Nepal.
3. **Research Assistant,** *Interdisciplinary Research Institute for Sustainability, Kathmandu, Nepal* **02/2021 – 07/2022**
   Research Projects:
   i. Benefit-cost analysis and stakeholders' perception study of various retrofitting techniques in Nepal.
   - Develop questionnaires and interview retrofit stakeholders such as professors, house owners, engineers, and I/NGOs. Collect responses in KoBoCollect application.
   - Search appropriate method for benefit-cost analysis based on research progress on Nepali building typologies.
   - Propose policies and strategies to disseminate the adoption of retrofit techniques in Nepal.

   ii. Application of Artificial Intelligence methods on earthquake-induced building damage assessment.
   - Collect and analyze post-earthquake damage assessment data of one million buildings from government authorities.
   - Apply artificial intelligence methods to predict EMS-98 building damage grade and rehabilitation intervention solutions based on buildings' physical attributes, seismic measures, and component-level damage using Python.

   iii. Comparison of post-earthquake infrastructure resilience during 1934, 1988, and 2015 earthquakes in Nepal.
   - Collect socio-economic and reconstruction data after 1934, 1988, and 2015 Nepal earthquakes from literacy and online sources and model infrastructure resilience after these events.

RESEARCH PUBLICATION & PRESENTATION

1. **K.C., S.,** Bhusal, A., Gautam, D., *(2023) "Earthquake damage and rehabilitation intervention prediction using machine learning"*, Engineering Failure Analysis, Elsevier. Link:
2. **K.C., S.,** Adhikari, R., Mandal, B., Gautam, D., (2022) *"Mechanical characterization of recycled concrete under various aggregate replacement scenarios"*. Cleaner Engineering and Technology, Elsevier. Link:
3. **K.C., S.,** & Gautam, D., (2021) "*Advances in sustainable structural engineering: a review*", Innovative Infrastructure Solutions, Springer. 6(2), 1-23. doi: 10.1007/241062-020-00419-3 Link:
4. **K.C., S.,** Bhochhibhoya, S., Adhikari, P., Adhikari, P., & Gautam, D. (2020), "*Probabilistic seismic liquefaction hazard assessment of Kathmandu valley, Nepal*", Geomatics, Natural Hazards and Risk. 11(1): 259-271. Link:
5. **K.C., S.,** Khanal, S., Guragain, S., Poster Presentation, **"***Comparison of Gorkha Earthquake Spectra with Various GMPEs",* Student Research Symposium on Earthquake Risk and Resiliency in Kathmandu, Nepal, January 2020 Link:
6. **K.C., S.,** Conference Presentation, *"Recycling the Rubble of Gorkha Earthquake for Construction Concrete",* International Conference on Health Engineering in Disaster (ICHED-2019), Pokhara, Nepal, May 1-2, 2019 Link:

PARTICIPATIONS AND AWARDS

1. **Seismological Society of America (SSA) Topical Meeting Travel Grant 2023**
   - Received $1,000 travel grant to participate in Physics-Based Ground Motion Modeling meeting in Vancouver, Canada
   - Awarded to only one graduate student.
2. **Nepal Academy of Science and Technology Promotional Award for Published Paper**, Award Rank: "Ka", 2021

- Category 'A' research publication award in the engineering category for paper "*Probabilistic seismic liquefaction hazard assessment of Kathmandu valley, Nepal"*.

2. **Participant,** *Pitch 200 Competition, ICE South Asia Region,* June 2018, Institution of Civil Engineers, UK. Video:
3. **Winner,** *Inter-College National Research Paper Presentation Competition***,** Jan. 2018, Pulchowk Campus, Nepal
   - Presented research on title "Development of Kathmandu valley as a smart city: challenges and opportunities"
   - Awarded 1st place out of 20 participants from 10 engineering colleges.
4. **Winner,** *Pictionary Event, NIRMAAN ICESS*, BMS college of Engineering, 3-4 November 2017, Bangalore, India.
   - Represented Nepal in the symposium with the theme **"**Smart Cities: A Drive to a Smarter World".
   - Awarded 1st place out of 80 teams from engineering colleges around South Asia in "Pictionary Event".
5. **Best Boy Award & Rank: 1**, *Faculty of Science*, Sainik Awasiya Mahavidyalaya, Bhaktapur (High School), 2015

TECHNICAL SKILLS AND LANGUAGE

Programming languages: Python (18 months), MATLAB (2.5 years)
Tools & Packages: Numpy, Pandas (Data Science, Data Manipulation), Seaborn & Matplotlib (Data Visualization), Scikit-learn (Classification, Regression), Pytorch (Deep Learning), Geopandas, OpenCV
Computer-aided design/engineering: AutoCAD, ArcGIS, SAP2000, ETABS, SAFE
Spoken Languages: English (Fluent), Nepali (Fluent), Sanskrit (Basic)

PROFESSIONAL EXPERIENCE

1. **Engineering Internship,** CLPIU (Building), *Government of Nepal* **10/2018 – 12/2018**
   - Site co-supervision of construction of earthquake-resistant buildings for Ministers of Government of Nepal.
   - Assisted engineers in preparing drawings and documents.
2. **Assistant Lecturer,** *Cosmos College of Management and Technology, Lalitpur, Nepal* **12/2019 – 1/2021**
   - Tutored Surveying-I (online, Fall semester), Surveying-II, and Applied Mechanics-II (Dynamics) (in-person cum online, Spring semester) subjects to classes of 48 students.
   - Supervised minor projects, assigned and graded homework promptly.

PROFESSIONAL AFFILIATION

1. Assistant Director, Pacific Earthqake Engineering Research Student Committee (PSC) Outreach Committee
2. Member, American Society of Civil Engineers (ASCE)
3. Member, Seismological Society of America (SSA)
4. Member, Earthquake Engineering Research Institute (EERI)
5. Member, Natural Hazards Engineering Research Infrastructure (NHERI) DesignSafe
6. Level 1 membership, Structural Extreme Events Reconnaissance (StEER) Network
7. Member, Nepal Engineering Council

LEADERSHIP & VOLUNTEERING

1. **Class Representative (CR),** *072/BCE/EF section, Pulchowk Campus* **11/2015 – 09/2019**
   - Lead and manage a class of 48 students during labs, field visits, and seminars.
   - Communicate with teachers and manage class routines and internal assessments dates.
2. **Program Coordinator,** *Civil Engineering Students' Society Nepal – Pulchowk Campus* **10/2018 – 09/2019**
   - Organized and hosted talk program (*Civil Engineering Talk: Learning Beyond the Curriculum*), panel talk (*Civil Engineering Panel Talk: Narratives of Passion and Purpose*), exhibition cum competition, and trainings.
   - Guest speakers in the talk program were some of the top-level policymakers and researchers of Nepal in the fields of structural engineering, hydropower, reconstruction, and infrastructure development.
   - Panelists of the panel talk program were Dean of I.O.E, Campus Chief of Pulchowk Campus, Department Chair of Department of Civil Engineering, and a student representative from the student union.
3. **President,** *Gulmi Arghakhanchi Palpa (GAP) districts students' society, Pulchowk Campus* **12/2017 – 12/2018**
   - Increased course books in the GAP library. Books can be taken for free and returned after the end of the semester.
   - Continued practice of curriculum books donation for library and fundraising for social events.
4. **Joint Treasurer,** *Kathmandu Valley Leo Club, Region IV, District 325-A1* **11/2017 – 11/2018**
   - Organized, and actively participated in various social and academic events.
5. **National Cadet Corps (NCC) volunteer,** *2015 Nepal Earthquake* **04/2015 – 05/2015**
   - Previously trained by Nepal Army as an NCC cadet to volunteer during a national crisis. Link:
   - Worked with Nepal Army and Pakistan Army Medical Corps in rescue and relief in the Bhaktapur district.