

SUGANDHA SINGH

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EDUCATION

North Carolina State University 2020

Raleigh, North Carolina US

Ph.D. in Civil Engineering

Major: Structural Engineering & Mechanics

Dissertation Title: Factors Affecting Seismic Response of Electrical Equipment in Nuclear Power Plants Subjected to High–Frequency Ground Motions

North Carolina State University 2017

Raleigh, North Carolina US

M.S. in Civil Engineering

Major: Structural Engineering & Mechanics

Thesis Title: Seismic Response of Electrical Equipment in Nuclear Power Plants

G.B. Pant University of Agricultural & Technology 2012

Pantnagar, Uttarakhand, India

B.Tech. in Civil Engineering

ACADEMIC APPOINTMENTS

Assistant Professor, Jaypee University of Information Technology July 2021–Present

Engineering Graphics with AUTOCAD (Online Instruction, Examination Grading)

Structural Dynamics (Faculty in–charge, M.Tech. 1st year)

Finite Element Method (Faculty in–charge, M.Tech. 1st year)

Guest Faculty, National Institute of Technology, Kurukshetra January – July 2021

CEIR12: Engineering Graphics (Instructor for Lectures as well as Drawing classes, Online mode)

CEPC14: Structural Analysis I (Faculty in–charge for three sections, Online mode)

CEPC22: Design of Concrete Structures–I (Instructor for Tutorial classes, Online mode)

Teaching Assistant

Graduate Courses

CE 527: Structural Dynamics (Teaching Assistant)

Spring 2017

Undergraduate Courses

CE 324: Structural Behavior & Measurements (Instructor of Record)

Fall 2017–Spring 2019

CE 382: Hydraulics (Tutor at Academic Support Program for Student Athletes)

Fall 2015

Research Assistant

Seismic Response of Electrical Equipment in Nuclear Power Plants

Parametric study to investigate the effects of geometrical nonlinearities on dynamic response of electrical equipment when subjected to high frequency earthquake. Comparison of various aspects such as linear vs nonlinear analysis; coupled vs uncoupled analysis, etc.

Evaluation of In Cabinet Response Spectra using Ritz Vector Approach

Implementing Ritz Vector method through MATLAB code to evaluate in cabinet response spectra (ICRS) for equipment mounted in electrical cabinets in nuclear power plants. The code reads user input from dialog boxes or text files, finds dynamic properties of cabinets, evaluates ICRS and saves all the output in an excel file.

Characterization of High-Frequency Attenuation in Low-to-Moderate Seismicity Regions: Insights on the Contribution of Sedimentary Deposits to Site-Specific Kappa (κ_{0_TF}) and Uncertainty Quantification in κ_{0_TF}

Understanding the variation of site-specific spectral decay factor, kappa, κ_{0_TF} with different soil parameters and recommending the methods to find κ without using ground motions. Kappa, κ is an important factor which could be used to generate high-frequency ground motions compatible with Probabilistic Seismic Hazard Analysis.

INDUSTRY EXPERIENCE

Shapoorji Pallonji & Co. Ltd. (Constructions Material Group), Mumbai, India 2012 – 2014

Title: Project Engineer/Coordinator

Coordinated various projects for the company such as Mumbai Metro One Private Ltd., National Museum of Indian Cinema, Sunrise Hospital, etc. Duties at this position included obtaining daily progress reports from site engineers, coordinating with vendors for different tasks of site, updating project timeline, billing, and reconciling vendor accounts.

PUBLICATIONS

Journal Papers (Published)

Singh, S., Gupta, A., (2021) “Seismic Response of Electrical Equipment Subjected to High-Frequency Ground Motions,” *In: Nuclear Engineering and Design*, Vol. 374, April 2021, 111046.

Singh, S., Gupta, A., (2021) “Understanding the Seismic Response of Electrical Equipment Subjected to High-Frequency Ground Motions,” *In: Progress in Nuclear Energy*, Vol. 140, October 2021, 103915.

Journal Papers (Submitted)

Singh, S., Gupta, A., (2021) “Effect of Boundary Conditions on Seismic Response of Electrical Equipment Subjected to High-Frequency Ground Motions” *In: Annals in Nuclear Energy*

Journal Papers (In Preparation)

Singh, S., Cabas, A., Gupta, A., (2021) “Quantification of the Contribution of Sedimentary Deposits to High-frequency Attenuation in Low-to-Moderate Seismicity Regions via the Site Transfer Function,” *In: Soil Dynamic and Earthquake Engineering*

Conference Papers

Singh, S., Gupta, A., “*Effect of High-Frequency Seismic Motions on Electrical Equipment in Nuclear Power Plants*,” SMiRT 25 (2019)

Vaishnav, P., **Singh, S.,** Gupta, A., “*Using Ritz Vector Approach to Evaluate In-Cabinet Response Spectra*,” SMiRT 25 (2019)

Reports

S. Singh and A. Gupta (2017). “*High Frequency Effects in Seismic Qualification of Electrical Equipment in Nuclear Facilities*,” Technical Report No.– CNEFS-11/2017. Center for Nuclear Energy Facilities and Structures, NC State University, Raleigh, NC.

PRESENTATIONS/CONFERENCES

“*Seismic Response of Electrical Systems Subjected to High Frequency Ground Motions*,” presented at the 19th Structural Engineering & Mechanics Symposium. March 2016

“*Seismic Response of Electrical Equipment in Nuclear Power Plants*,” presented at the 22nd Structural Engineering & Mechanics Symposium. March 2018

“*Effect of Boundary Conditions on Seismic Response of Electrical Equipment*,” presented at the 23rd Structural Engineering & Mechanics Symposium. March 2019

“Effect of High-Frequency Seismic Motions on Electrical Equipment in Nuclear Power Plants,” presented at the 25th International Conference on Structure Mechanics in Reactor Technology, Charlotte NC. August 2019

Attended Geotechnical Earthquake Engineering and Soil Dynamics V, Austin, TX. June 2018

Attended 16th Symposium on Earthquake Engineering, IIT Roorkee, India. December 2018

Attended & Organized 25th Conference on Structural Mechanics in Reactor Technology, Charlotte, NC. August 2019

Attended Earthquake Engineering Research Institute (EERI) Next Generation Attenuation (NGA) East Seminar, Gaithersburg MD. October 2019

“Quantifying Near-Surface Attenuation via Site-Specific Kappa (κ_0) to Improve High-Frequency Ground Motion Characterization in Central and Eastern United States,” presented at the DOE/NRC Natural Phenomena Hazards Meeting, Virtual Conference. October 2020

PROFESSIONAL DEVELOPMENT

New teaching assistant training workshop Fall 2017

Teaching & Communication Certificate 2017 – 2018

Academic Packaways May 2018

UNIVERSITY SERVICE

Graduate Student Representative, Council on the Status of Women at NC State 2016 – 2018

- Chair, Safety Subcommittee (2016-2017)
- Member, Equity for Women Awards Subcommittee (2016-2017)
- Member, Sisterhood Dinner Planning Subcommittee (2016-2018)

Member, Administrative Board of Graduate School 2018 – 2019

Member, Mental Health Initiative Committee 2018 – 2019

STUDENT INVOLVEMENT

Vice President of Academic Affairs, Graduate Student Association 2018 – 2019

Member, Graduate Student Association 2015 – 2018

Council Representative & Social Media coordinator, Civil Engineering Graduate Student Association 2015 – 2018

PROFESSIONAL MEMBERSHIP

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| Seismological Society of America | 2018 – present |
| Earthquake Engineering Research Institute | 2019 – present |

LANGUAGES

English (Fluent)

Hindi (Native)

CODING LANGUAGES/SOFTWARES

FORTRAN, C, C++, Python, MATLAB

SAP2000, OpenSEES, STRATA, SHAKE

COMMUNITY INVOLVEMENT

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| Volunteer Mentor at Community Hope, Southridge site with YMCA | March 2018 – March 2020 |
| Volunteer Presenter, Juntos Academy Initiative | June 2018 |
| Volunteer, Service Raleigh | 2016, 2018 |

REFERENCES

1. Abhinav Gupta

Professor, Department of Civil, Construction & Environment Engineering, North Carolina State University, Raleigh, NC, USA

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2. Ashly Cabas Mijares

Assistant Professor, Department of Civil, Construction & Environment Engineering, North Carolina State University, Raleigh, NC, USA

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3. Narendra Kumar Yadav

Chief Engineer (Retd.), Uttarakhand Irrigation Department
Alumni IIT Roorkee, Batch 1983

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4. Vanessa Doriott Anderson

Senior Director of Professional Development Programming
Director of Teaching and Communication Programs
The Graduate School, NC State University

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5. Babita Saini

Associate Professor
Department of Civil Engineering
National Institute of Technology, Kurukshetra

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