

Arjun Jayaprakash

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RESEARCH INTERESTS

- Performance Based Design and Assessment of Structures
 - Earthquake and Natural Hazards Engineering
 - Large-scale Testing of Structural Steel and Reinforced Concrete Structures
 - Implementation of Statistical Learning in Civil Engineering
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EDUCATION

North Carolina State University, Raleigh, NC

PhD. Civil Engineering

June. 2016 – May. 2020

GPA: 4.0 / 4.0

North Carolina State University, Raleigh, NC

Master of Civil Engineering

Aug. 2014 – May. 2016

GPA: 3.9 / 4.0

National Institute of Technology Calicut, Calicut, India

Bachelors of Technology in Civil Engineering

Jul. 2007 – May. 2011

GPA: 7.4 / 10.0

WORK APPOINTMENTS

North Carolina State University, Raleigh, NC

Instructor on Record - CE 214 Statics

May. 2019 – Dec. 2019

North Carolina State University, Raleigh, NC

Teaching Assistant

May. 2019 – May. 2020

North Carolina State University, Raleigh, NC

Doctoral Research Assistant

Jun. 2016 – May. 2020

Duke TIP, Sherman, TX

Instructor

May. 2015 – Jul. 2015

Satish Jain and Co., Mumbai, India

Structural Design Engineer

Sep. 2012 – Aug. 2013

Shapoorji Pallonji, Chennai, India

Graduate Engineer (Planning)

Aug. 2011 – Sep. 2012

RESEARCH PROJECTS

Grouted Shear Stud Connection at Low Temperatures

Guide: Dr. James Nau, Dr. Mohammad Pour-Ghaz, and Dr. Mervyn Kowalsky

Jun. 2016 – May. 2019

- Used small and large-scale experiments to determine the longevity of the grouted shear stud connection in cold climates.
- Performed numerical modeling of large-scale experiments for parametric studies.

Characterizing the Loading History of Ground Motions

Guide: Dr. Mervyn Kowalsky

Jul. 2018 – Jul. 2019

- Used analysis software OpenSees and Ruaumoko to perform non-linear dynamic analyses of structures.
- Used the analysis results to perform statistical inference to characterize loading history of ground motions.

Sensitivity of Non-linear Time History Analyses to Choice of Viscous Damping Models in MDOF systems

Guide: Dr. Mervyn Kowalsky

Jan. 2018 – Apr. 2018

- Used analysis software Seismostruct to perform non-linear time history analyses of multi-span bridges to investigate different damping models.
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PUBLICATIONS

Journal Articles - Submitted

- **Jayaprakash, A., Nau, J., Pour-Ghaz, M., and Kowalsky, M.,** "Grout Deterioration and its Impact on the Structural Performance of the Grouted Shear Stud Connection", *Journal of Constructional Steel Research*, Preprint submitted in September 2019.

Journal Articles - Preparing for Submission

- **Jayaprakash, A.** and Kowalsky, M., “Opposite Peak Ratio to Characterize Seismic Loading History for Performance Based Design”, *Earthquake Spectra*, Preprint to be submitted in October 2019.

Conference Proceedings

- **Jayaprakash, A.** and Kowalsky, M.J., “Mean Balance Ratio to Characterize Ground Motion Loading History for Performance Based Design.”, *Proceedings of the 12th Canadian Conference on Earthquake Engineering*, Quebec City, QC, Canada, June 2019.
- **Jayaprakash, A.**, Nau, J., Pour-Ghaz, M., and Kowalsky, M., “Structural Consequences of Grout Deterioration in the Grouted Shear Stud (GSS) Connection.”, *Proceedings of the Bridge Engineering Institute Conference 2019*, Honolulu, HI, USA, July 2019.

Technical Reports

- **Jayaprakash, A.**, Nau, J., Pour-Ghaz, M., and Kowalsky, M., “Durability of the Grouted Shear Stud Connection at Low Temperatures.”, *Tech. Rep. FHFWY00039*, Alaska Department of Transportation and Public Facilities, Juneau, AK, USA, May 2019.
- **Jayaprakash, A.**, Price, C., Jiang, A., Pour-Ghaz, M., Nau, J., and Kowalsky, M., “Comparison of Cylinder and Cube Strength for Typical Grouts.”, *Summary Report RD-18-01*, Constructed Facilities Laboratory, Dept. of Civil, Construction and Environmental Engineering, NC State University, Raleigh, NC, USA, Jan 2018.

PRESENTATIONS

Conferences, Workshops, and Symposia

- “Is the Grouted Shear Stud Connection Durable in Cold Climates?”. *Bridge Engineering Institute Conference 2019 (BEI 2019)*, Honolulu, HI, USA, July 22-25, 2019.
- “Characterizing Seismic Load History for Performance Based Design”. *12th Canadian Conference on Earthquake Engineering (CCEE 2019)*, Quebec City, QC, Canada, June 17-20, 2019.
- “Structural Performance of the GSS Connection”. *Research Workshop at Alaska Department of Transportation and Public Facilities*, Juneau, AK, USA, May 6-8, 2019.
- “Durability of Cementitious Grouts in Cold Climate”. *Research Workshop at Alaska Department of Transportation and Public Facilities*, Juneau, AK, USA, May 6-8, 2019.
- “Structural Consequences of Grout Deterioration in the GSS Connection”. *Structural Engineering and Mechanics Symposium at NC State University*, Raleigh, NC, USA, March 1, 2019.

HONORS and AWARDS

- **Graduate Student Association Travel Assistance Award**, North Carolina State University, Raleigh, NC, USA, July 2019.
- **College of Engineering Conference Travel Award**, North Carolina State University, Raleigh, NC, USA, June 2019.
- **Preparing the Professoriate Completion Certificate**, North Carolina University, Raleigh, NC, USA, May 2019.
- **Teaching Assistantship**, North Carolina State University, Raleigh, NC, USA, May 2019 to present.
- **Doctoral Student Grant**, North Carolina State University, Raleigh, NC, USA, June 2016 to May 2019.
- **Prime Minister’s Scholarship for Undergraduate Studies**, Calicut, India, July 2007 to May 2011.

MEMBERSHIPS AND POSITIONS

- **Member**, Earthquake Engineering Research Institute (EERI), USA, 2015 to present.
 - **Student Member**, American Society of Civil Engineers (ASCE), 2018 to present.
 - **Secretary**, EERI Student Chapter, NCSU, June 2019 to present.
 - **Graduate Mentor**, RISE program for Undergraduate Research, NCSU, Summer 2019.
 - **Graduate Advisor**, Team NCSU, EERI Seismic Design Competition, June 2018 to March 2019.
 - **Student Representative to the Student Affairs Council**, National Institute of Technology Calicut, Calicut, India, Aug 2010 to May 2011.
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SKILLS & OTHERS

Large-scale Testing: Steel and Concrete Columns, FRP wet layup, Optotrak and DIC Instrumentation

Numerical Modeling: OpenSees, Ruaumoko, Seismostruct, MATLAB, R

Programming Languages: R, MATLAB, Tex, Tcl, Python

Mathematics: Linear Algebra, Probability Theory, and Monte Carlo Simulation

Statistical Learning: Regression, Classification, Generalized Linear Models, Tree Based Methods

Certifications: Fundamentals of Engineering Exam, Preparing the Professoriate