



# Sinha Sumeet K

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## Education

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<b>University Of California Davis (GPA - 4.0/4.0)</b> <i>Masters:, Geotechnical Engineering</i>	<b>California, USA</b> 2015–2017
<b>Indian Institute of Technology Delhi</b> <i>Research Assistant:, Civil Engineering</i>	<b>Delhi, India</b> 2014–2015
<b>Indian Institute of Technology Delhi (GPA - 4.0/4.0)</b> <i>B. Tech:, Civil Engineering Major Computer Science Engineering Minor</i>	<b>Delhi, India</b> 2010–2014

## Research Experience

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<b>Master Thesis</b> <i>Advisor : Dr. Boris Jeremic</i> <i>Nonlinear Effects in Soil Structure Interaction:</i> Developed new non-linear normal contact and shear interface elements to correctly model the soil-structure interface for dry as well as fully/partially-saturated soil conditions. Developed preprocessor <i>gmESSI</i> and post-processor <i>pvESSI</i> and integrated with <a href="#">Real-ESSI Simulator</a> to make it a complete Finite Element simulation system. Extended the code for parallel computation and optimized output for running large simulations.	<b>UC Davis</b> 2015–2017
<b>Research Assistant</b> <i>Advisor : Dr. G V Ramana</i> <i>Stochastic 1-D Seismic Ground Response Analysis of NCT Delhi :</i> A Stochastic study of 1-D equivalent linear seismic ground response analysis of Delhi, by undertaking the uncertainties associated with the depth of bed rock varying from 50–300 m was performed, to find its effect on amplification factor (AF) and response spectrum (RS). Finally, a response spectrum for Delhi was proposed based on the depth of bed rock which could be used to produce a safer and economic design for future building constructions.	<b>IIT Delhi</b> 2014–2015
<b>B. Tech Thesis</b> <i>Advisor : Dr. Bappaditya Manna</i> <i>Nonlinear Dynamic Response of Floating Piles :</i> Developed programs for studying the frequency-amplitude response of single pile subjected to dynamic vertical, coupled and torsional loads using Finite Element Approach (FEM). The program modeled the stiffness and damping parameters of linear and nonlinear soil models using Continuum Approach.	<b>IIT Delhi</b> 2010–2014

## Teaching Experience

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Fall'17 **ENG 35, Statics:** substituted lectures and held office hours for over 160 students, UC Davis  
Fall'16 **ENG 104, Mechanics of Materials:** substituted lectures and held office hours, UC Davis  
Fall'15 **ECI 171, Soil Mechanics:** prepared assignments and midterms, UC Davis  
Spr'14 **ENG 222, Soil Mechanics:** conducted soil mechanics tutorials for 120+ students, UC Davis  
Fall'13 **CVL 242, Structural Analysis I:** assisted in structural lab experiments, UC Davis

## Honors And Awards

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**Nominated For Outstanding Graduate Student Teaching Award**, (March, 2017), UC Davis  
**Jawahar Gajri Bai Award** (March 2014), IIT Delhi  
**Ministry Of Human Resource Development MCM Scholarship**, 2010-2014, IIT Delhi  
**Semester Merit Award**: awarded to top 7% institute-wise, 2010-2011-2012-2014, IIT Delhi  
**UG Assistantship Award** (2013-2014), IIT Delhi  
**Hindustan Pratibha Samman** (May 2010)

## Professional Experience

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**Seminar Coordinator : Geotechnical Graduate Student Society, UC Davis** (2017-Present)

- Got Selected as official host for 2017-2018 Cross USA and 58th Rankine Lecture.
- Coordinated Weekly seminars with speakers from academia and industry.

**Technical Officer : Indian Graduate Student Association, UC Davis** (2017-Present)

- Designed website with professional look, one of the best among student group organization.
- Created IGSA Logo, organized events: Diwali Night, Rang de Davis and technical workshops.

**Website Coordinator : Geotechnical Graduate Student Society, UC Davis** (2016-2017)

- Completely transformed the website to gave a fresh and professional look.
- The showcase through the website lead to the annual Round Table a success.

**Manager : Society For Advancement Of Research In Arts And Science** (Dec. 2012 - 2014)

- Let a team of 16 at IIT Delhi and expanded the organization to an affect population of 2000.
- Piloted Audio Visual Education System (AVES), an ICT solution for quality primary education.
- Started E-Kiosk Information Center, an ICT platform for rural-networking and information.

**Internee : Civtech Consultants Pvt. Ltd, Noida, Delhi, India** (May 2013 - July 2013)

- Designed a 25+ storey residential structure (DLF Sec-79) in STAAD/ETABS and performed VBA modeling to obtain COR (Center of Rigidity) to optimize steel requirements from effects of torsion.
- Prepared and delivered presentations on importance of quality checks & safety at construction sites

**Internee : Delhi Metro Railway Corporation, New Delhi, India** (May 2012 - July 2012)

- Supervised, performed quality checks on concreting, water proofing, piling and construction of diaphragm wall and launching/receiving shaft at Janpath. Got unique opportunity to work with Tunnel Boring Machines (TBM) and learned about ring erection, segment handling and tunnel design.
- Gave valuable suggestions on integration plan of Metro Stations and visited Batch Mixing Plant and India's largest casting yard in Mundaka.

## Publications

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### Books

Boris Jeremić with contributions by Zhaohui Yang, Zhao Cheng, Guanzhou Jie, Nima Tafazzoli, Panagiota Tasiopoulou, Federico Pisanò, José Abell, Kohei Watanabe, Yuan Feng, **Sumeet Kumar Sinha**, Fatemah Behbehani, Han Yang, Maxime Lacour and Hexiang Wang. *Computational Mechanics: Inelastic Finite Elements for Pressure Sensitive Materials*. Available upon request (not for sale). 2302 pages, 2017. ([pdf of overview](#))

### Papers in Referred Journals

Han Yang, **Sumeet Kumar Sinha**, Yuan Feng, David B McCallen, and Boris Jeremić. *Energy*

*dissipation analysis of elastic-plastic materials*. Computer Methods in Applied Mechanics and Engineering [Manuscript submitted for publication] 2017.

**Sumeet Kumar Sinha**, Sanjit Biswas and Bappaditya Manna. *Nonlinear Characteristics of Floating Piles Under Rotating Machine Induced Vertical Vibration*. Journal of Geotechnical and Geological Engineering, Volume 33, Issue 2, April 2015, Pages 1-18.(pdf)

## Proceedings of Referred Conferences.....

Han Yang, Yuan Feng, **Sumeet Kumar Sinha**, Hexiang Wang, and Boris Jeremić. *Energy Dissipation in Soil Structure Interaction System*. Abstract Accepted for the 5th Geotechnical Earthquake Engineering and Soil Dynamics (GEESD) Conference, Austin, Texas. June 10-13, 2018. (abstract)

**Sumeet Kumar Sinha**, Fatemah Behbehani, and Boris Jeremić. *Modelling of buoyant forces in earthquake soil-structure interaction*. In proceedings of 15th International Conference of the International Association for Computer Methods and Advances in Geomechanics, Wuhan, China, 19-23 October 2017.(pdf)

Han Yang, **Sumeet Kumar Sinha**, Yuan Feng, and Boris Jeremić. *Evaluation of Energy Dissipation in Elastic-Plastic Solids*. Proceedings of the 15th International Conference of the International Association for Computer Methods and Advances in Geomechanics (IACMAG), Wuhan, China. October 19-23, 2017. (pdf)

**Sumeet Kumar Sinha**, Yuan Feng, Han Yang, Hexiang Wang, and Boris Jeremić. *3-D non-linear modeling and its effects in earthquake soil-structure interaction*. Proceedings of the 21st Structural Mechanics in Reactor Technology (SMiRT) Conference, Busan, Korea. August 20-25, 2017. (pdf)

Hexiang Wang, Han Yang, **Sumeet Kumar Sinha**, Chao Luo, and Boris Jeremić. *3-D Non-Linear Earthquake Soil-Structure Interaction Modeling of Embedded Small Modular Reactor (SMR)*. Proceedings of the 21st Structural Mechanics in Reactor Technology (SMiRT) Conference, Busan, Korea. August 20-25, 2017. (pdf)

Yuan Feng, José Antonio Abell, **Sumeet Kumar Sinha**, Han Yang, Fatemah Behbehani, Hexiang Wang, Nebojša Orbović, David B McCallen, and Boris Jeremić. *Verification for the Real ESSI Simulator*. Proceedings of the 21st Structural Mechanics in Reactor Technology (SMiRT) Conference, Busan, Korea. August 20-25, 2017. (pdf)

J. A. Abell, **Sumeet Kumar Sinha**, Boris Jeremić. *Wavelet Based Synthetic Earthquake Sources for Path and Soil Structure Interaction Modeling: Stress Testing of Nuclear Power Plants*. In proceedings of IAEA conference on: Best Practices in Physics-based Fault Rupture Models for Seismic Hazard Assessment of Nuclear Installations Vienna, Austria, November 18-20, 2015.(pdf)

**Sumeet Kumar Sinha**, Sanjit Biswas and Bappaditya Manna. *Nonlinear Damping Response of Floating Piles Under Vertical Vibration*. Proceedings of Computer Methods and Recent Advances in Geomechanics, ISBN 9781138001480, September 2014, Pages 951-956.(pdf)

## Reports And Manuals.....

**Sinha, Sumeet K.** and Boris Jeremić. *PvESSI – Visualization Plugin for Real-ESSI Simulator System*. University of California Davis,2017. (pdf) .

**Sinha, Sumeet K.** and Boris Jeremić. *GmESSI – Gmsh to Real-ESSI Input Translator*. University of California, Davis, 2017. (pdf)

José Abell, **Sumeet Kumar Sinha**, Yuan Feng and Boris Jeremić. *Real ESSI Simulator Executable Build Procedures*. UCD–CompGeoMech–03–2017.

José Abell, **Sumeet Kumar Sinha**, Yuan Feng and Boris Jeremić. *Real ESSI Simulator Output*

Formats. UCD–CompGeoMech–03–2017.

José Abell, Yuan Feng, **Sumeet Kumar Sinha**, Fatamah Behbehani and Boris Jeremić. *Real ESSI Simulator Domain Specific Language (DSL)*. UCD–CompGeoMech–02–2017.

**Sinha, Sumeet K.** and Yuan Feng. *Preconditioning techniques for large scale iterative linear system solvers*. University of California Davis, June 2016. ([pdf](#))

**Sinha, Sumeet K.** *Soil pile non-linear analysis of vertical vibration*. Technical report, Indian Institute Of Technology Delhi, 2014. ([pdf](#))

## Technical Presentations.....

**Sumeet Kumar Sinha**, Fatamah Behbehani, Han Yang, and Boris Jeremić. *Modelling of Buoyant Force in Earthquake Soil Structure Interaction*. The 15th International Conference of the International Association for Computer Methods and Advances in Geomechanics (IACMAG), Wuhan, China. October 19-23, 2017. ([pdf](#))

José Antonio Abell, Yuan Feng, **Sumeet Kumar Sinha**, Nebojša Orbović, Davis B McCallen, and Boris Jeremić. *3D vs 1D vs 3x1D Ground Motions and the Earthquake Soil Structure Interaction*. The 21st Structural Mechanics in Reactor Technology (SMiRT) Conference, Busan, Korea. August 20-25, 2017. ([pdf](#))

Yuan Feng, **Sumeet Kumar Sinha**, José Antonio Abell, Han Yang, Fatamah Behbehani, Nebojša Orbović, Davis B McCallen, and Boris Jeremić. *Nonlinear effects in Earthquake Soil Structure Interaction of Nuclear Power Plants*. The 21st Structural Mechanics in Reactor Technology (SMiRT) Conference, Busan, Korea. August 20-25, 2017. ([pdf](#))

Hexiang Wang, Yuan Feng, Han Yang, **Sumeet Kumar Sinha**, Davis B McCallen, and Boris Jeremić. *Nonlinear Earthquake Soil Structure Interaction Analysis for Small Modular Reactors*. The 21st Structural Mechanics in Reactor Technology (SMiRT) Conference, Busan, Korea. August 20-25, 2017. ([pdf](#))

Yuan Feng, José Antonio Abell, **Sumeet Kumar Sinha**, Han Yang, Fatamah Behbehani, Nebojša Orbović, Davis B McCallen, and Boris Jeremić. *Verification for the Real ESSI Simulator*. The 21st Structural Mechanics in Reactor Technology (SMiRT) Conference, Busan, Korea. August 20-25, 2017. ([pdf](#))

**Sinha, Sumeet K.** *3-D Modeling of Shear Box (one of the largest in US) in Real ESSI Simulator System*. Poster Presentation in UC Davis Geotechnical Graduate Student Society (GGSS) 10th Round Table, Davis, CA. March 10, 2017. ([pdf](#))

**Sinha, Sumeet K.** *New Developments in Real ESSI Simulator System*. Presentation in DOE Project Meeting at University Of California Davis, March, 201.([pdf](#))

**Sinha, Sumeet K.** *Contact mechanics in Real ESSI Simulator system*. Presentation in DOE Project Meeting at University Of California Davis, June, 2016. ([pdf](#))

## Softwares Applications Contributed/Developed

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**Real ESSI Simulator System** : Boris Jeremić, Guanzhou Jie, Zhao Cheng, Nima Tafazzoli, Panagiota Tasiopoulou, Federico Pisanò José Antonio Abell, Kohei Watanabe, Yuan Feng, **Sinha, Sumeet K.**, Fatamah Behbehani, Han Yang, and Hexiang Wang. University of California, Davis and Lawrence Berkeley National Laboratory, 2017.

**gmESSI** : General translator to convert Gmsh (.msh) mesh to Real ESSI Simulator input (.fei) files.

**pvESSI** : Plugin in ParaView for visualization of Real ESSI Simulator output.

**CPT Based Liquefaction Triggering SpreadSheet** : MS Excell sheet for identifying liquefiable layers based on *Boulanger and Idriss (JGGE 2015)*.

**Beamalyzer** : 3-D finite element matlab program to perform analysis of beams.

## Relevant Courses

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ECI 281A : Advance Soil Mechanics I (Prof Bruce Kutler)

ECI 281B : Advance Soil Mechanics II (Prof Jason Dejong)

ECI 289D : Geotechnical Earthquake Engineering I (Prof Bruce Kutler)

ECI 287 : Geotechnical Earthquake Engineering II (Prof Ross Boulanger)

ECI 286 : Advance Foundation Design (Prof Jason Dejong)

ECI 284 : Theoretical Geomechanics (Prof Boris Jeremić )

ECI 203 : Inelastic Behavior of Solids (Prof Yanis Dafalias)

ECI 201 : Introduction to Theory of Elasticity (Prof N Sukumar)

ECI 212A : Finite Element Procedures (Prof N Sukumar)

ECI 280A : Finite Element for Elastic-Plastic Materials (Prof Boris Jeremić)

ECI 280B : Dynamic Finite Elements (Prof Boris Jeremić)

ECS 231 : Scientific Computation (Prof Zhaojun Bai)

ECS 230 : Applied Numerical Algebra (Prof François Gygi)

## Skills

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**Programming:** Matlab, Python, C/C++, LaTeX

**Softwares:** DeepSoil, Shake91, Ansys, Abaqus, ArcGIS, Staad Pro, Etabs, FEM with 3-D Plasticity