
NHERI SIMCENTER PROGRAMMING BOOTCAMP

JULY 30 THROUGH AUGUST 3, 2018, AT UC BERKELEY'S RICHMOND FIELD STATION



Center for Computational Modeling and Simulation



MATTHEW SCHOETTLER

University of California, Berkeley

- Research activities include seismic design and retrofit of reinforced concrete buildings and bridges, evaluation of existing tall buildings, re-centering systems, and seismic isolation applications including nuclear power plants. The incorporation of innovative technologies for seismic hazard mitigation is of particular interest. Oh, and novel software development for the NHE community!



RESEARCH ENGINEER

Fun fact: I've never had an advisor/boss pronounce my name properly.



GRACE



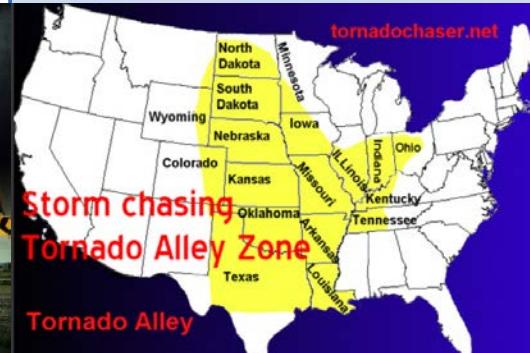
ASSISTANT PROFESSOR

Missouri University of Science and Technology

- Tornadoes



Photo by Brad Goddard



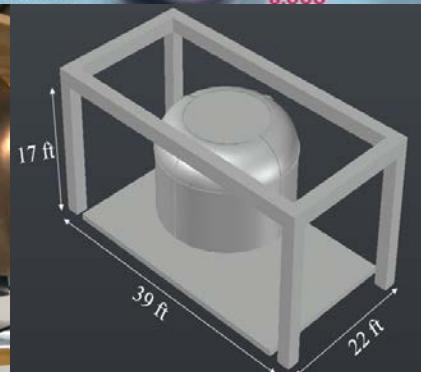
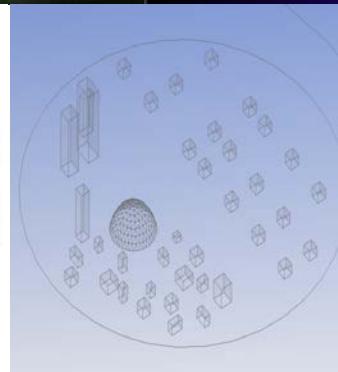
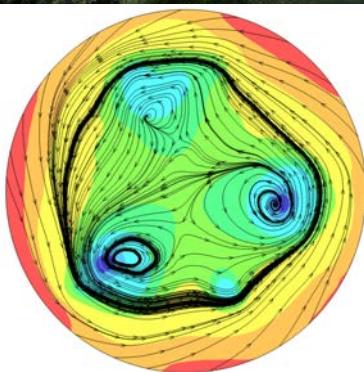
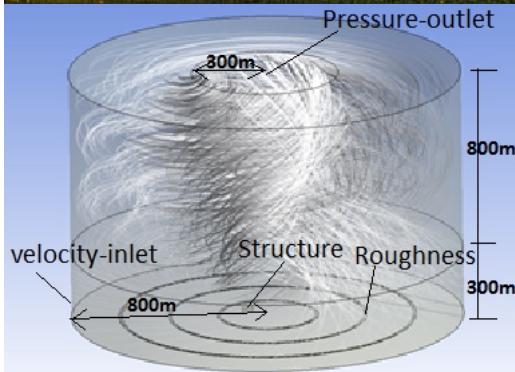
The 2011 Joplin Tornado: Learning from a Disaster

The NIST investigation into the Joplin, Mo., tornado was the most comprehensive scientific investigation of a tornado in history.

\$2.8 billion
Total damages; costliest tornado event in U.S. history

161
People were killed; this was the single deadliest tornado in the U.S. since official record keeping began in 1950.

84%
Of deaths resulted from building and structural failures

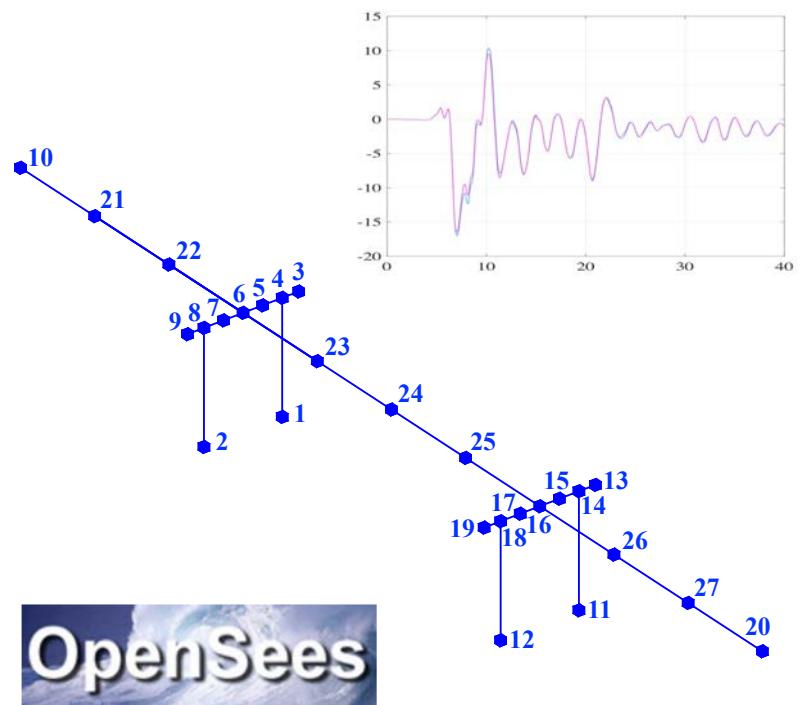


JADE COHEN

PHD STUDENT

University of California, Berkeley

- Originally from France (*Ecole Nationale des Ponts et Chaussées*)
- Now doing a PhD at UC Berkeley with Pr. Filippou
- My research focuses on performing more accurate and more robust **nonlinear response history analyses of bridges subjected to earthquake excitation**
- I am planning to use C-language to help develop improved element and material models in OpenSEES

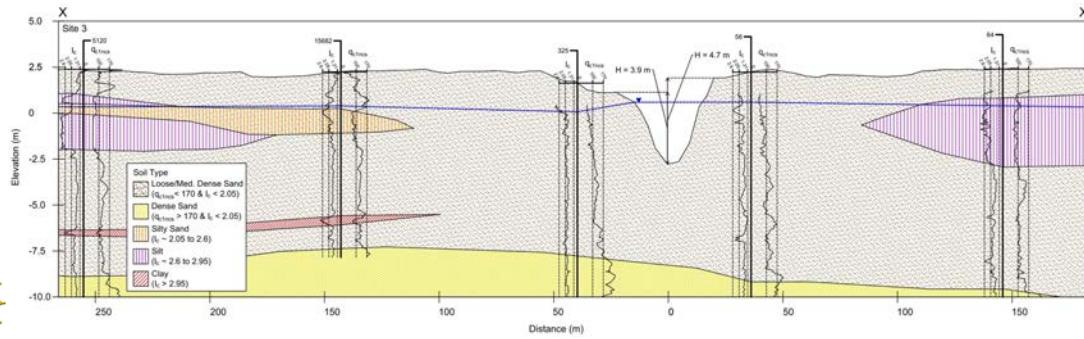


OpenSees

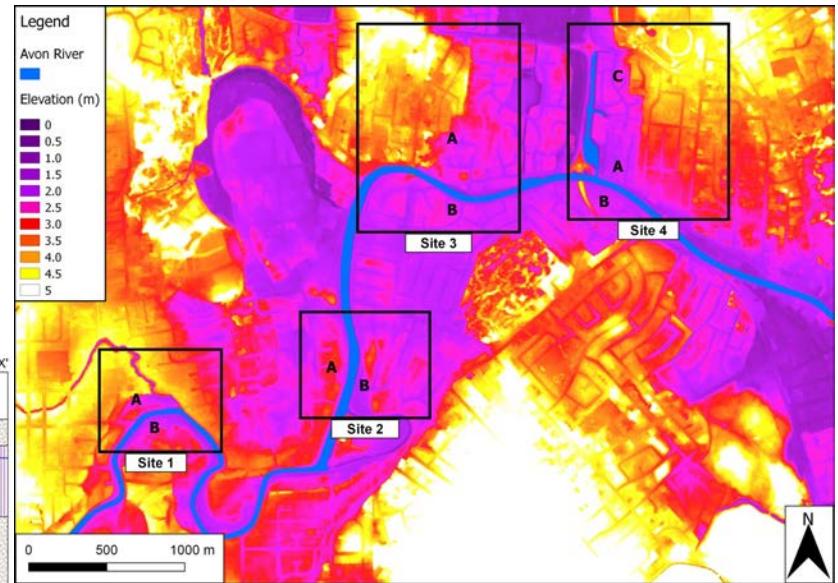


The University of Texas at Austin

- Research involves the characterization of lateral spread site during the M6.2 2011 Christchurch, New Zealand Earthquake and using the abundant data from the New Zealand Geotechnical Database along with OpenSees to model some of the lateral spread sites and gain insights on the main characteristics influencing lateral spreading.
- I use programming all the time for my research and it will be very useful to: a) get some kind of formal programming experience, and b) to learn more about application development



Fun fact: First (and only!) EQ I experienced was the 2014 Napa Valley EQ



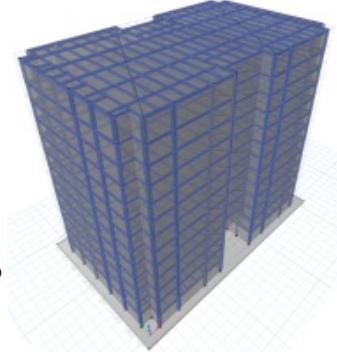
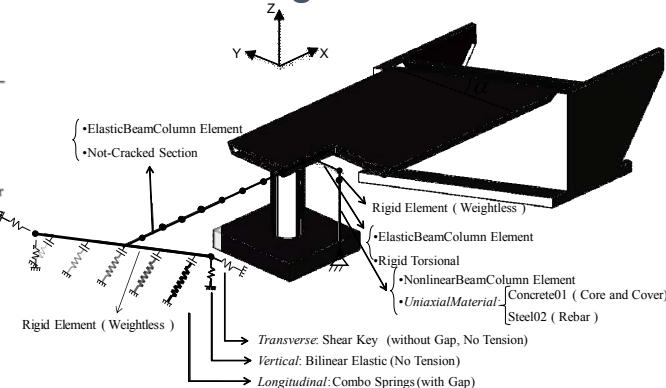
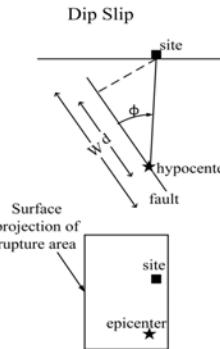
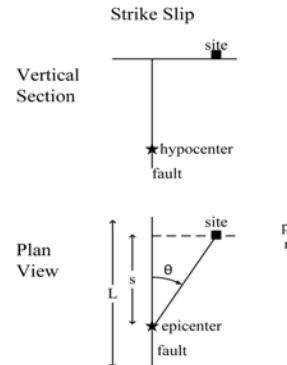
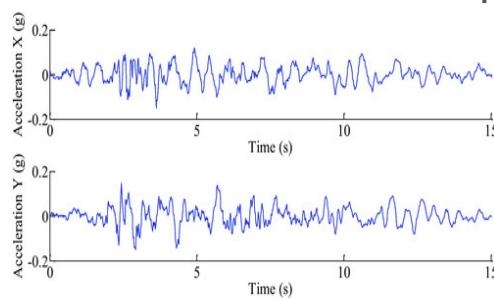
JAWAD FAYAZ

GRADUATE STUDENT RESEARCHER

University of California - Irvine

FUN FACT: I practice Muay Thai Kickboxing

- Hail from the state of Jammu and Kashmir in India. Came to UCI as a Master's student and currently pursuing PhD under Dr. Farzin Zareian.
- Work primarily on developing Guidelines for Ground Motion Modeling for Performance Based Earthquake Engineering of Ordinary Bridges where the end goal is to develop a simplified desktop application for the Seismic Design community.
- Other research activities include Reliability Analysis of Buildings, Model Updating, Ground Motion Characterizations etc.
- Highly interested in learning different programming languages and algorithms especially those involved in the current hot topics : "Artificial Intelligence and Machine Learning"



NEAL (SIMON) KWONG

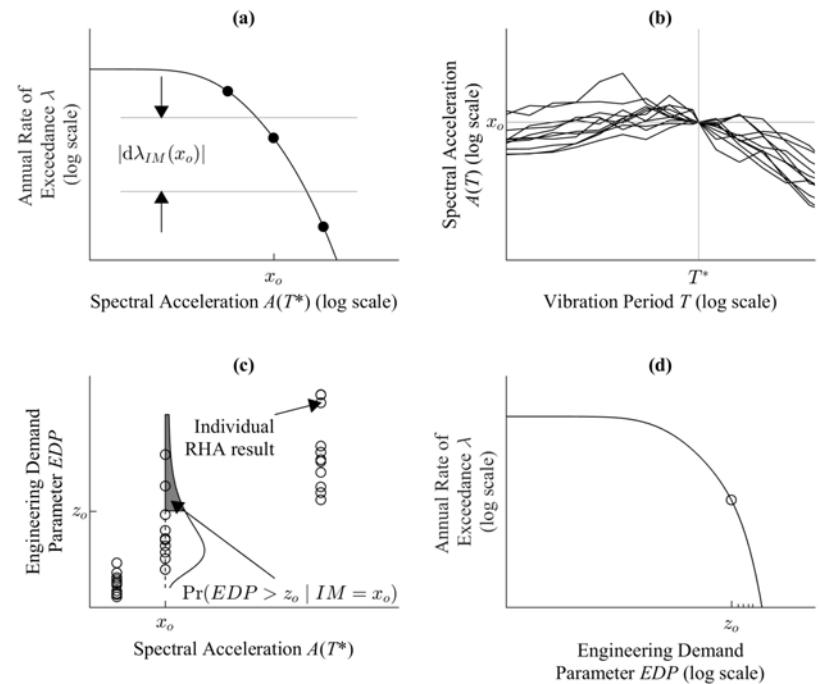
ASSISTANT PROFESSOR (CE)

The Cooper Union

- NYC native with MS & PhD degrees from SEMM at UC Berkeley; expert in ground motion selection for dynamic analyses. Current research focuses on simplified methods for risk-based assessments of structures. In my free time, I enjoy learning about holistic wellness. From this bootcamp, I hope to learn how to: use HPC resources for OpenSEES, create publicly available tools for seismic performance assessments, manage data using modern concepts, and apply programming concepts that can be useful for future students in CE.



Fun fact: Solved Rubik's cube (blindfold)



SEUNG JAE LEE

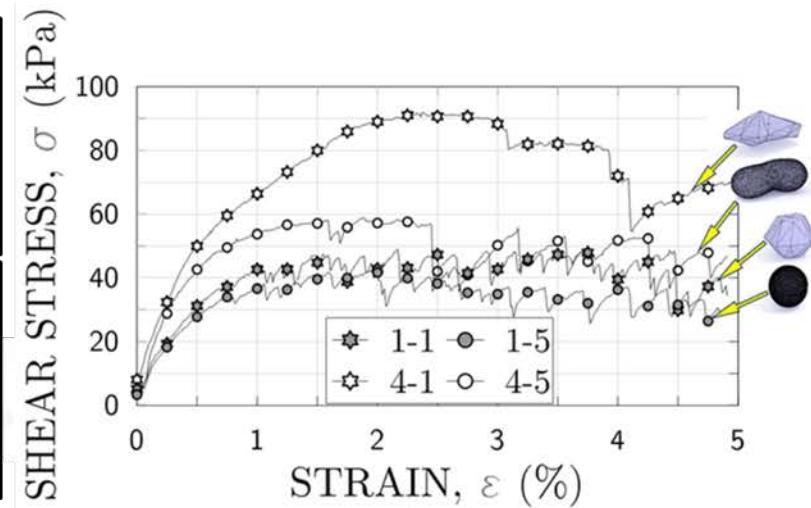
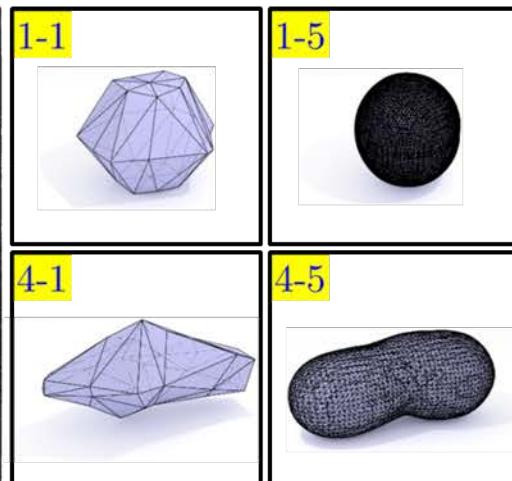
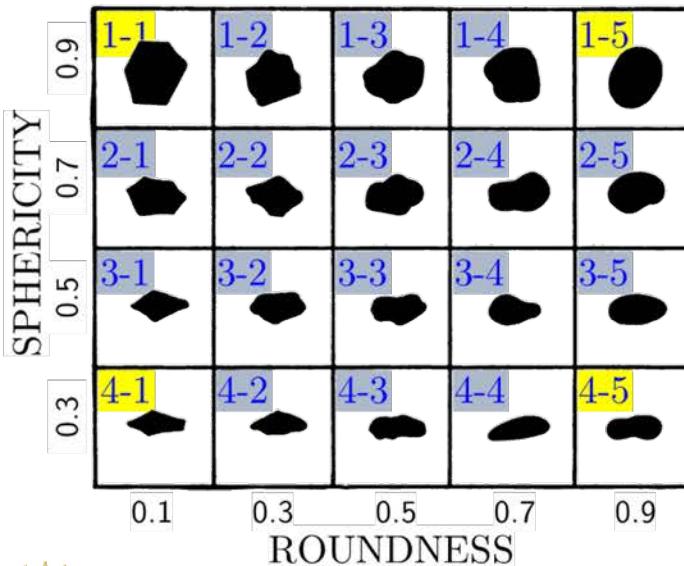
Geometric Origin of Geomechanical Property



Florida International University

Fun fact: I married my wife I met at 6th grade

- Ph.D. from University of Illinois at U-C (Focus: Computational Geomechanics)



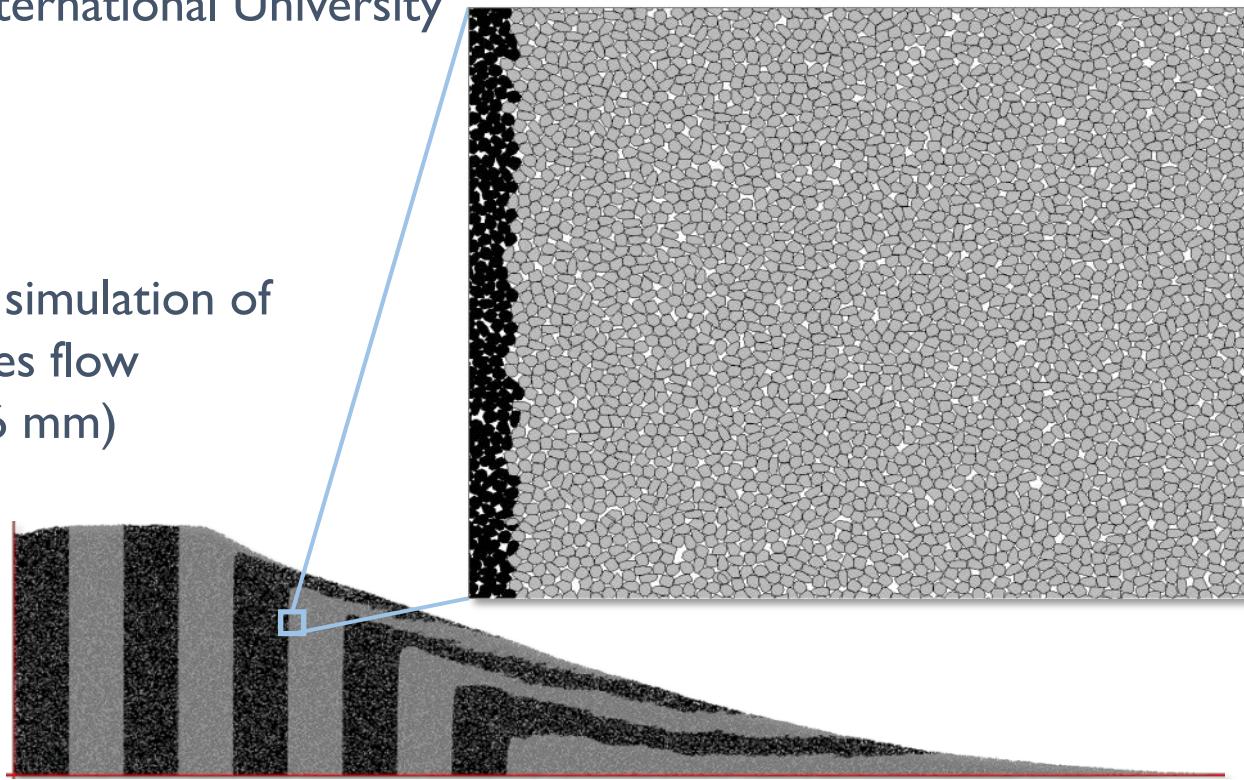
SEUNG JAE LEE

Geometric Origin of Geomechanical Property



Florida International University

Discrete element simulation of
0.5 million particles flow
(Particle size: ~0.6 mm)

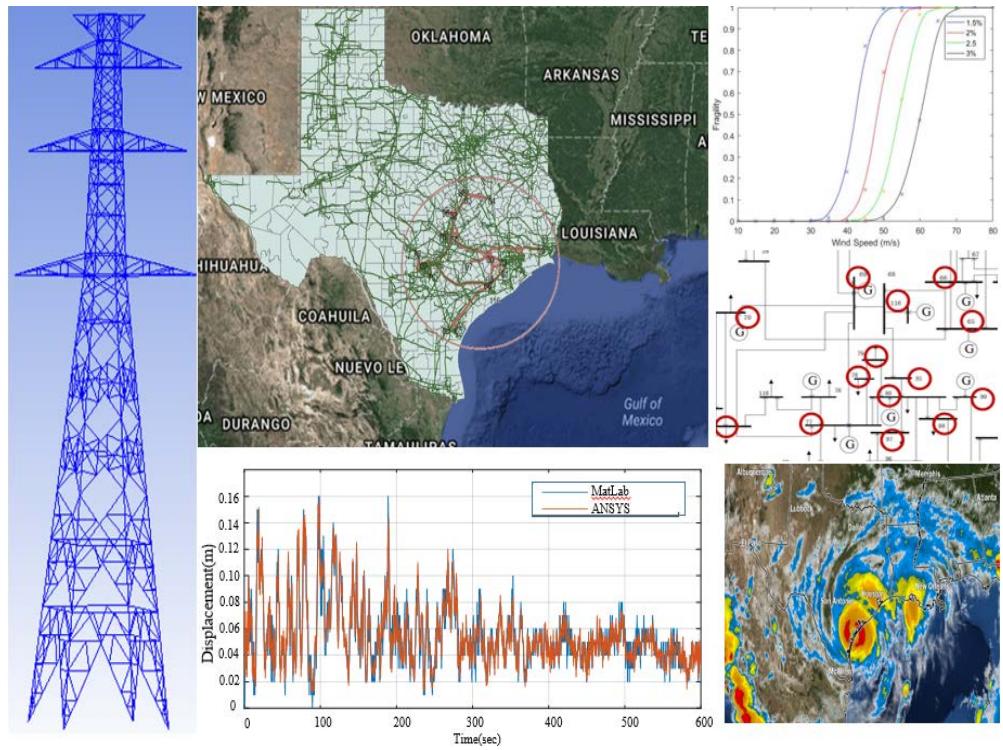


University of Utah

- Research activities include modeling transmission tower, simulating dynamic wind load and fragility analysis of transmission tower and power system.
- I am interested in the simulation for natural hazards engineering. Now we work on simulating hurricane's impact on the transmission towers and lines.



Fun fact: I am crazy about Harry Potter.



CHRIS PYKE

GRADUATE RESEARCH ASSISTANT

University of Washington

- I am originally from Sandwich, MA and just completed my undergraduate career at UMaine where I helped with research into floating offshore wind technologies. This month I began my graduate career researching the design of vertical evacuation structures to resist tsunami loading. I hope to learn from this workshop new tools to help me model tsunami inundation on individual structures and communities.



Fun fact: I have visited 5 different nation parks so far this summer

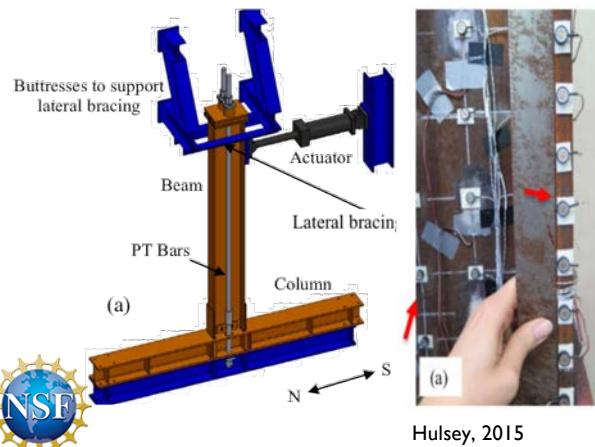


SEDEF KOCAKAPLAN

PHD CANDIDATE

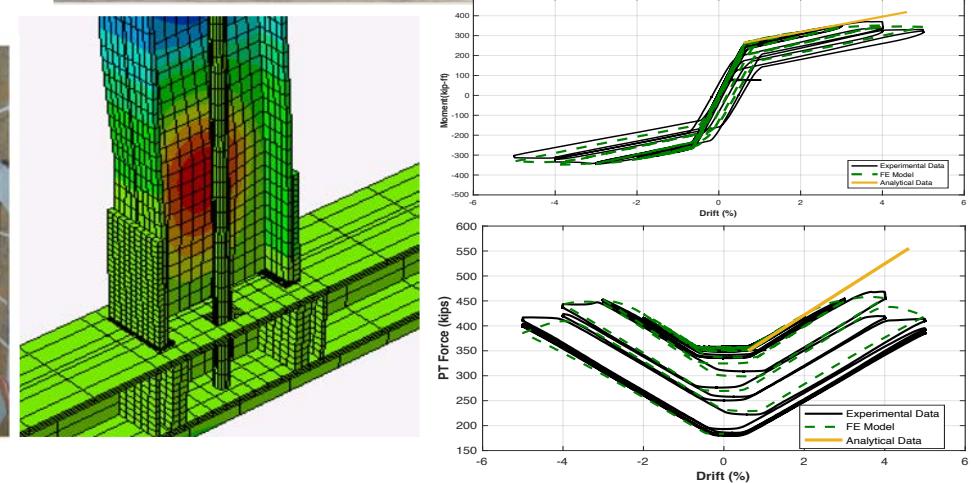
The University of Texas at Austin

- Research interests and activities consist self-centering moment resisting frames, wave propagation in initially stressed rods and health monitoring of structures. Current research investigates limit states and strength degrading behaviors of post-tensioned steel beam-to-column connections. ABAQUS models are employed in a parametric study, requiring significant computational resources, and thus necessitating the use of a TACC allocation.



Hulsey, 2015

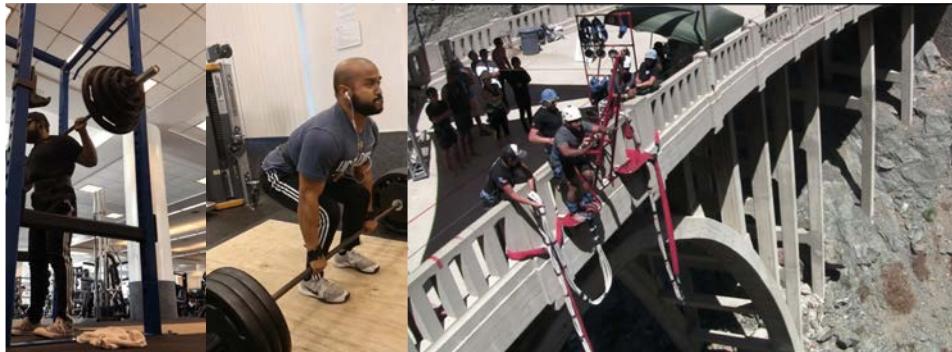
Fun fact: In English my full name means Mother_of_Pearl Hugetiger.



ANGSHUMAN DEB

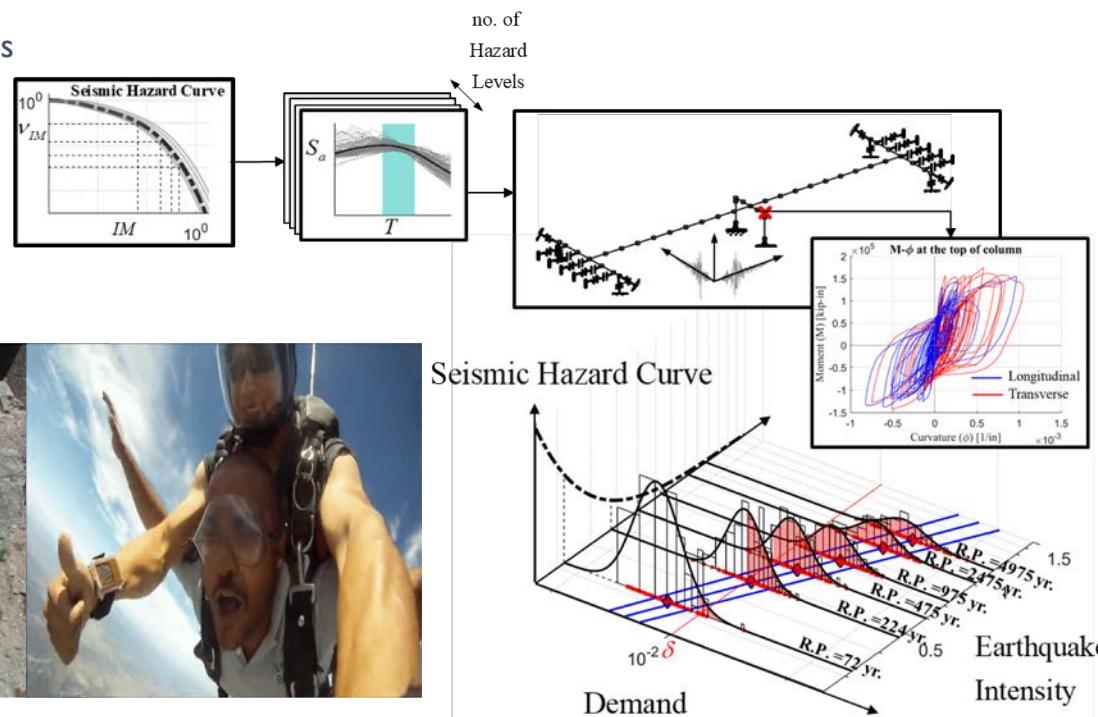
University of California San Diego

- Research includes development of probabilistic performance-based assessment and design methodologies for ordinary standard bridges in California which is expected to lead to the design of safer and more economic structures, especially with regard to seismic hazard
- Interests: Powerlifting, bodybuilding, hiking, being outdoors, adventure sports



GRADUATE STUDENT RESEARCHER

Fun fact: My hair loss and Ph.D. started together. Just a coincidence. Or is it?

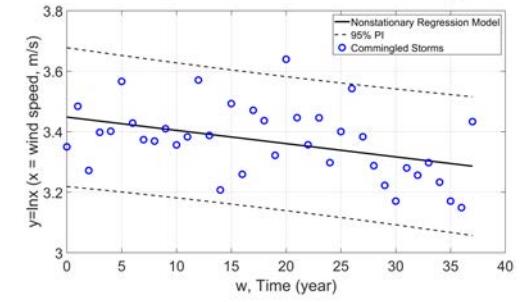
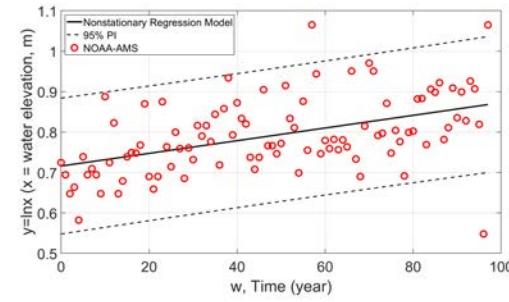
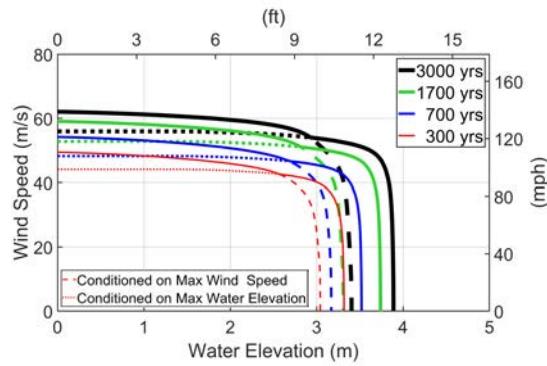


YIMING JIA

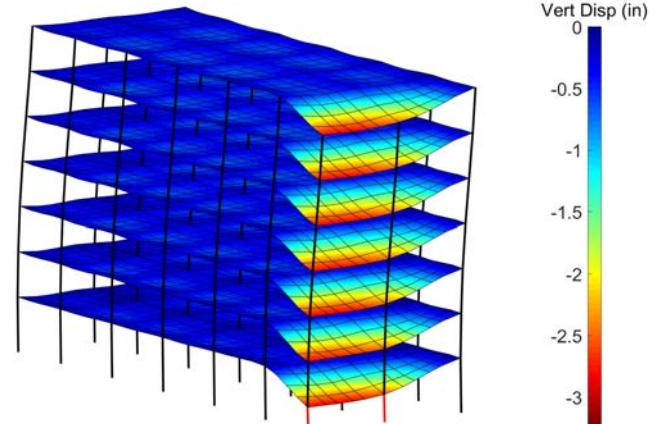
RESEARCH ASSISTANT

Northeastern University, Boston, MA

- Research activities include modeling joint probability of flood and wind hazards, nonstationary flood and wind frequency analysis, system-level collapse analysis of non-ductile reinforced concrete structures under seismic ground motion and assessment of the probability of collapse.
- After the workshop, I plan to apply new coding skills to perform multi-hazard simulation and system-level collapse analysis.



Fun fact: I have a rhino iguana which can grow up to 4 feet and may outlive me.

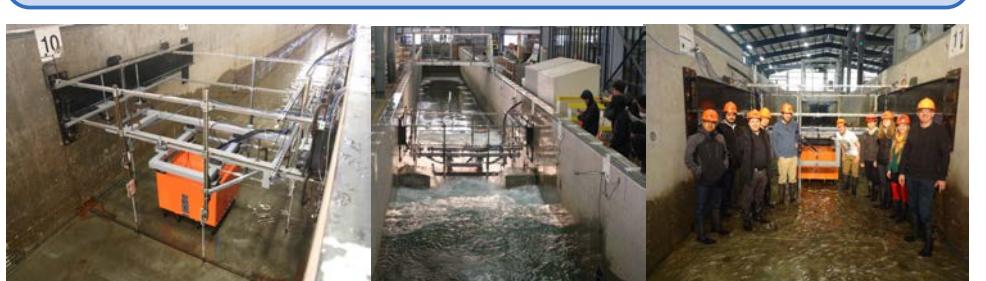
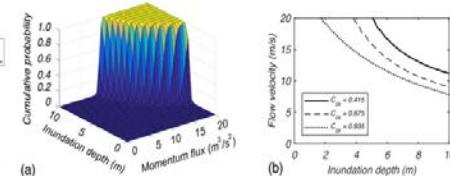
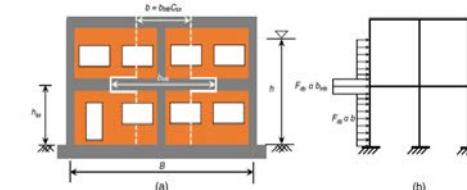
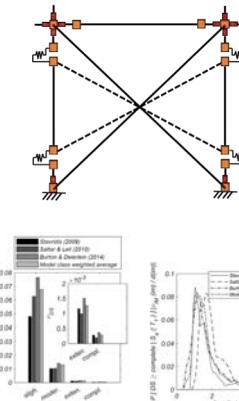
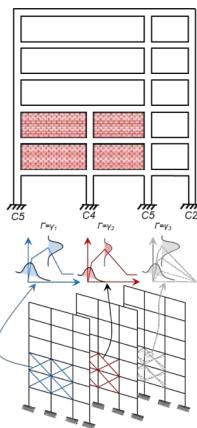


MOHAMMAD SHAFIQUAL ALAM

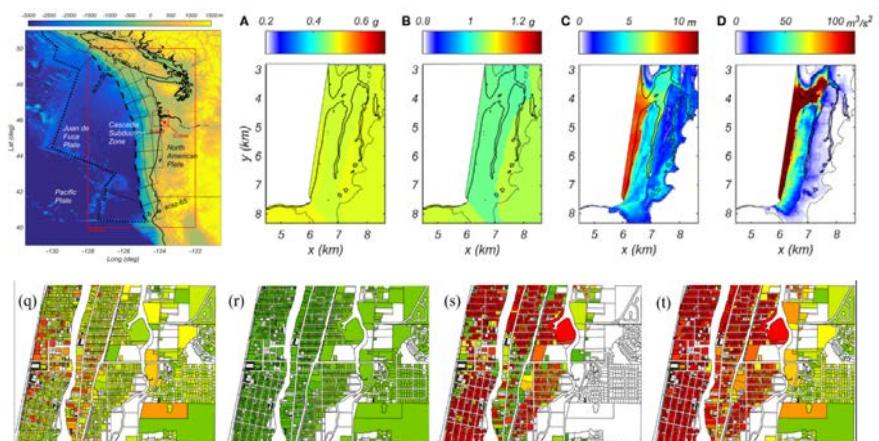
PHD CANDIDATE

Oregon State University, Corvallis, OR

- Research interests include the performance evaluation of built environment subjected to earthquake and tsunami hazard at both building scale and community scale, high performance and high throughput computing. The seismic and tsunami design and assessment of RC frame building through numerical simulation are of special interest. Moreover, I am interested in the development and improvement of tsunami design guidelines through laboratory testing to improve the resilience of coastal communities.



I am from Bangladesh. I love to travel, hike, watch soccer, and cricket.



XINGQUAN GUAN

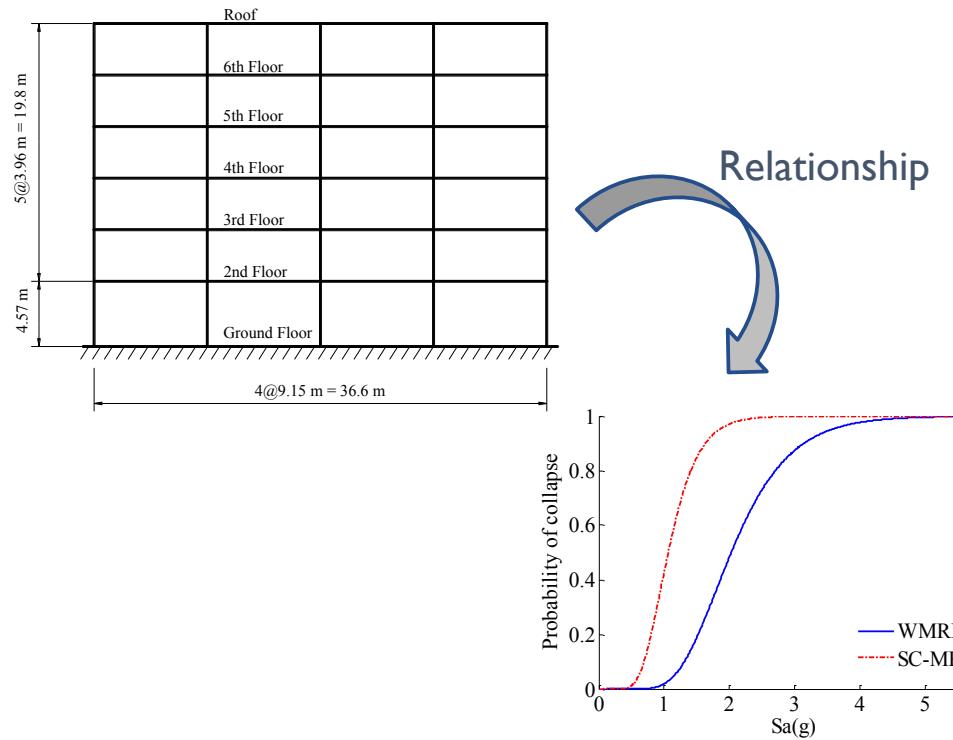
PH.D. STUDENT

University of California, Los Angeles

- Research Topic: Performance-based analytics-driven seismic design of steel moment frame buildings.
- Research Objective: Find the relationship between building parameters and structural response.
- Why I attend Bootcamp: I will use parallel computing methodology in my research.



Fun fact: Never try to call me using my first name.



DEAR PARTICIPANTS

We will start the workshop with a brief introduction from all participants. For this, we ask you to complete the following slide - using this provided template – and return it to us NLT July 25 to <schoettler@berkeley.edu>.

- Tell us a bit about yourself
 - What school/college/university? Research Scientist at the University of California, Berkeley and the Pacific Earthquake Engineering Research Center
 - Where are you from originally? Turkey
 - Personal goals? Observe this workshop as an example to plan for similar Boot Camps on hybrid simulation & Become familiar with more C++ applications
 - Hobbies? Reading, hiking
 - Fun fact? I like to eat chocolate cake slices after midnight. It is instant joy, but has sad consequences.
- Tell us a little bit about your research.

Various aspects of earthquake/structural engineering including hybrid simulation, performance based earthquake engineering, nonlinear dynamic analysis solution methods, progressive collapse simulations, structural health monitoring, machine/deep learning



APOSTOLOS ATHANASIOU

VISUAL CRACKING ASSESSMENT ON RC STRUCTURES

The University of Texas at Austin

- I was born and raised in Athens, Greece. Right after my graduation from National Technical University of Athens back in 2016, I started pursuing my PhD at UT Austin. My research focuses on the assessment cracked reinforced concrete structures using Computer Vision. Specifically I develop damage estimation models which predict the damage level of concrete structures. Through this workshop I expect to get exposed to HPC tools and utilize them for rapid structural assessment of structures



Fun fact: I push on my GitHub everyday...

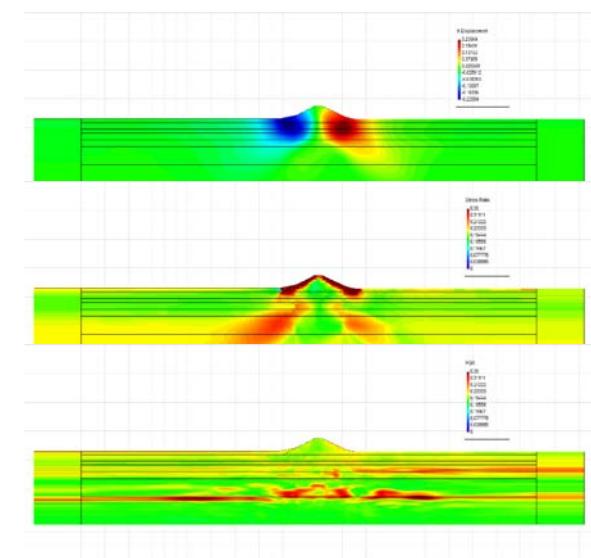
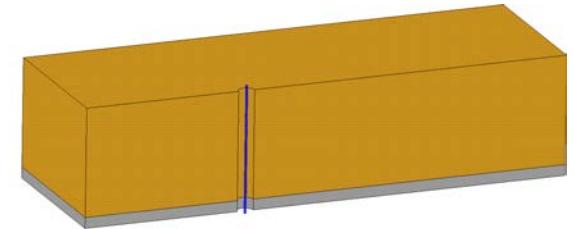
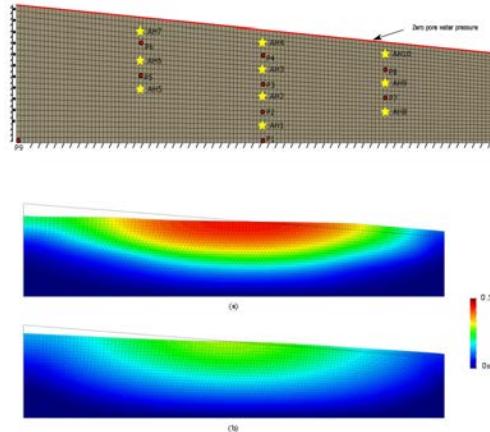
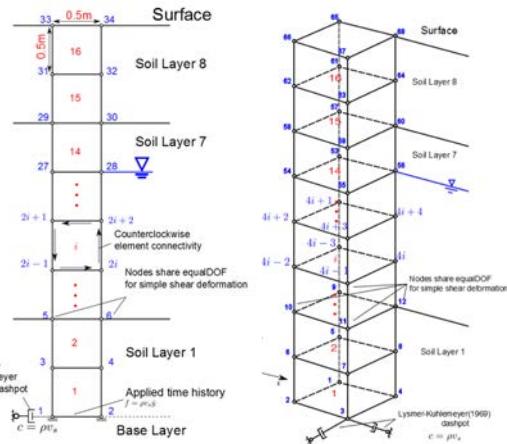


LONG CHEN

PHD STUDENT

University of Washington

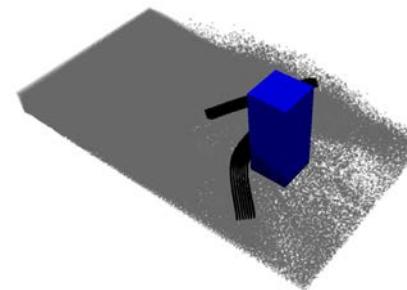
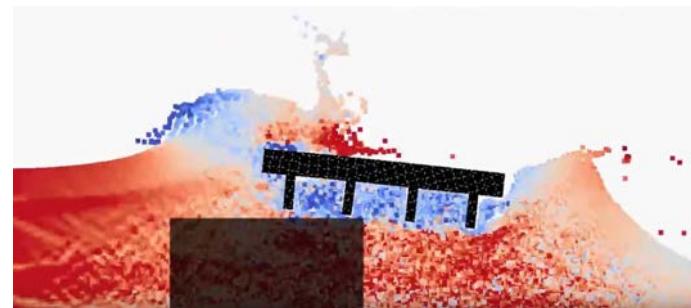
- Research activities include implementation of material model and apply it to soil structure interaction and site response. Past and ongoing research projects include estimation of shear demands on rock socketed piles subjected to lateral loading, 1D site response analysis, prediction of lateral spreading of sloping liquefiable soils and liquefaction susceptibility analysis of tailing dams.



KRISHNENDU SHEKHAR, PHD STUDENT

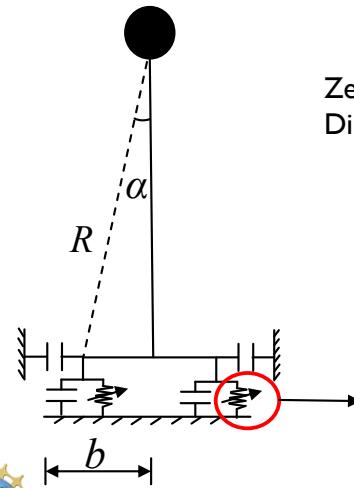
My research involves developing and implementing an incompressible fluid formulation in the Material Point Method (MPM) to simulate tsunami driven debris flow followed by validation using wave driven debris impact experiments.

I am interested in developing a C++ application to simulate Tsunami driven debris impacts on parallel hardware.

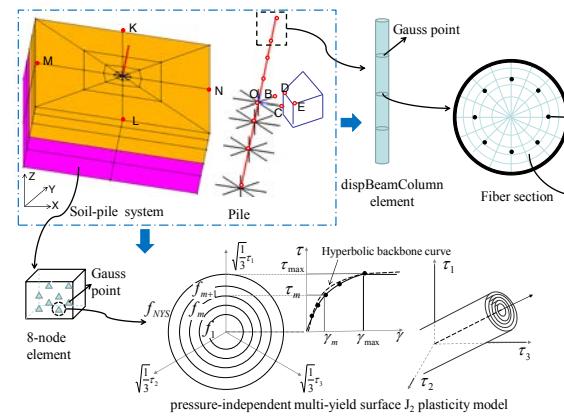
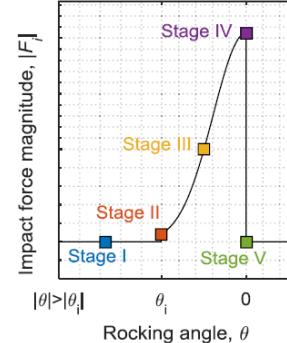


University of California, Los Angeles

- Research activities include Seismic performance of rocking systems. Finite element response sensitivity and reliability analyses of structures and soil-structure interaction systems. Structural optimization.



Zero-length rocking element with Dirac-delta type impact model



Fun fact: I am from the famous wine city.

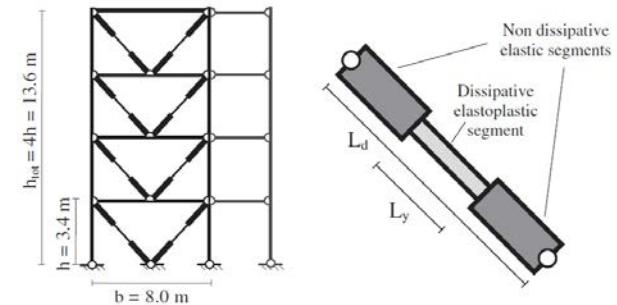
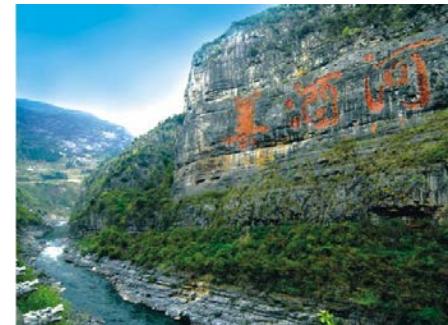


Fig. 2. Benchmark problem: (a) 4-storey model with bracing system and equivalent column; (b) BRB element.

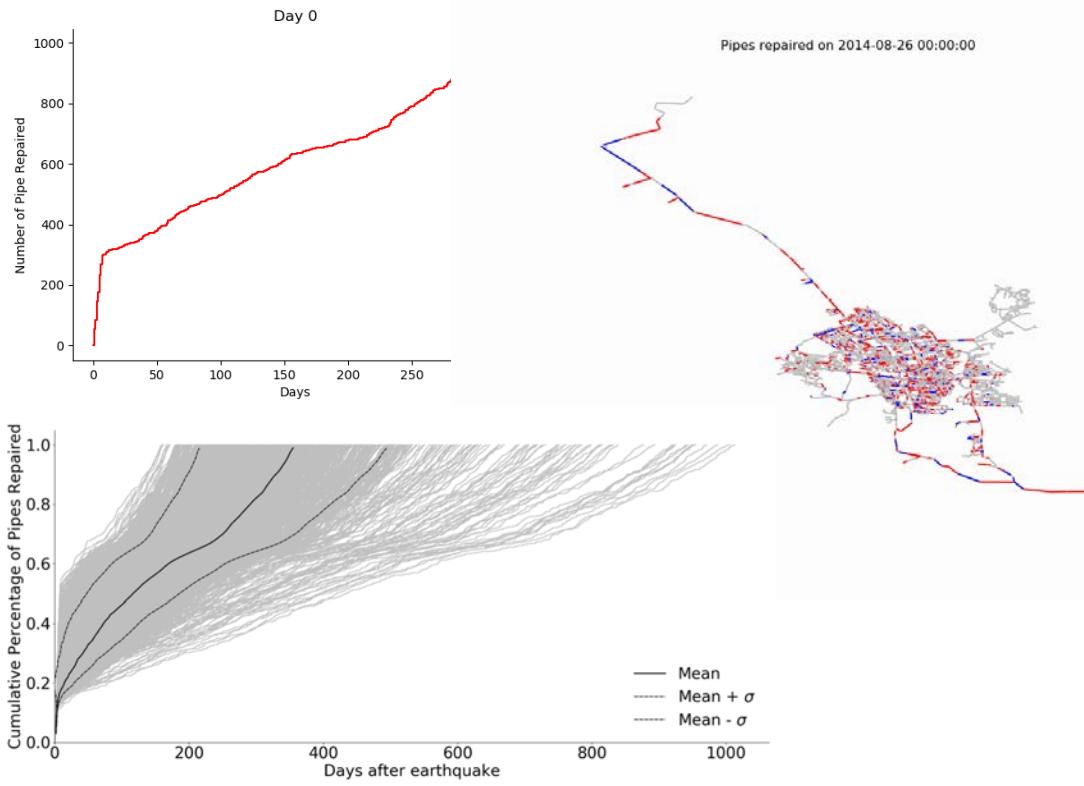
AGAM TOMAR

PH.D. CANDIDATE

University of California, Los Angeles

Fun fact: I can dance to any beat 😊 (Indian Style)

- Research includes Post-Earthquake Restoration Modeling of Water Distribution Systems. Decision making considering ‘What-If’ Earthquake Scenarios, their impact and restoration techniques.
- I plan to use the HPC (High Performance Computing) infrastructure to run restoration models on large scale (in parallel).



MOHSEN ZAKER ESTEGHAMATI

Virginia PolyTechnic Institute and State University

■ About me:

- ✓ Born in Rasht, Iran (small town near the Caspian sea)
- ✓ Futuristic and Sci-fi enthusiast
- ✓ Hiking, watching anime and sketching

■ My current research project:

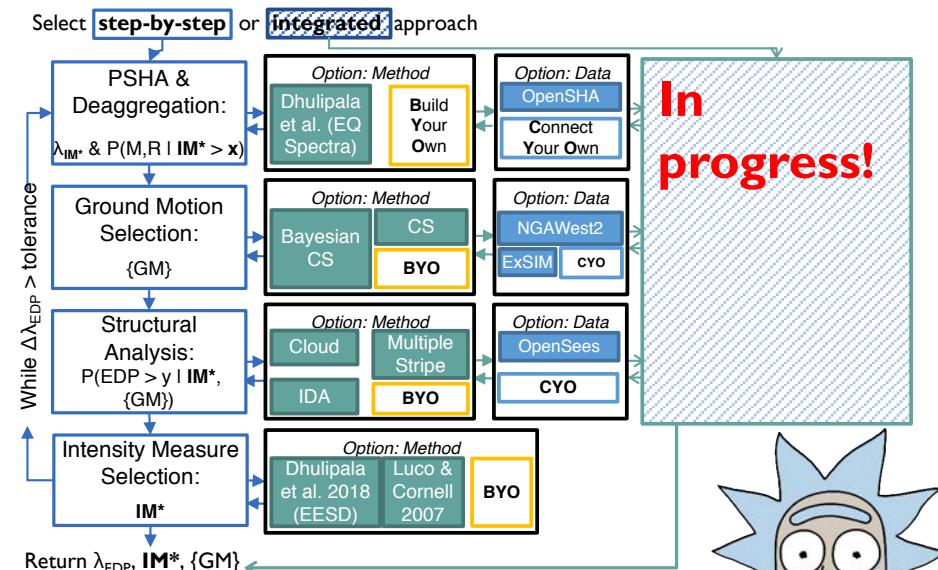
Create a conceptual framework for joint evaluation of hazard, IMs, GMs, and structural demands

■ I intend to use what I learn in this workshop to:

Build a new workflow in NHERI SimCenter to support automated IM/GM selection

GRADUATE STUDENT

Fun fact: I wanted to be an artist. I ended up being an engineer. I think they are the same.



MUKESH RAMANCHA

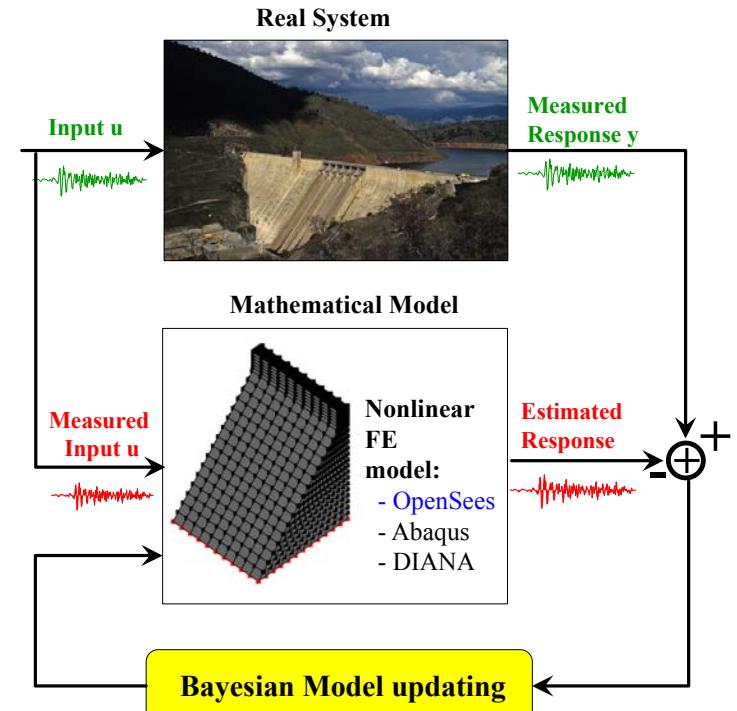
University of California, San Diego

- I'm Indian, born and bred. Of course, I love cricket (sport, not an insect).
- PhD research on Bayesian nonlinear finite-element model updating for structural health monitoring, damage diagnosis and prognosis of civil engineering systems.
- Solving the above inverse problem requires running the FE model hundreds and thousands of times. Looking forward to this programming boot camp.
- Personal goal: Still searching! But for now "Get a KTM SUPER DUKE and explore the unseen".



GRADUATE STUDENT RESEARCHER

Fun fact: Beatboxing! But my friends say I'm terribly terrible at it.



MATT JOYNER

Northeastern University

RESEARCH ASSISTANT

Fun fact: My wife is from Brazil

- Research interests include:
 - Performance-based earthquake engineering
 - Building resilience under multiple hazards
 - Seismic performance of reinforced concrete structures
 - Resilience-based design for earthquakes
 - Optimization of building resilience
- I plan to use what I learn here to improve my modeling and simulation capabilities

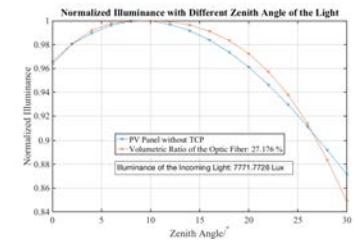
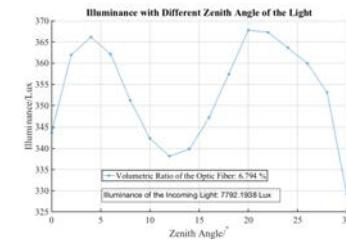
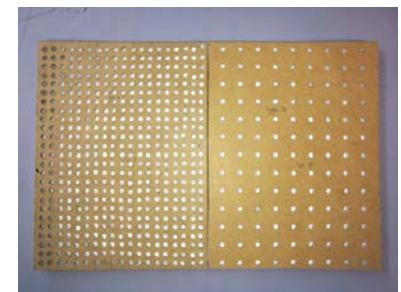
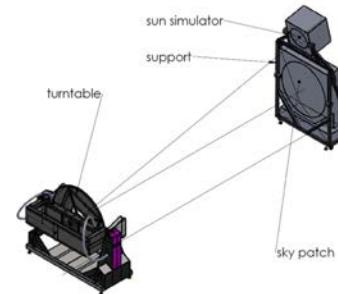
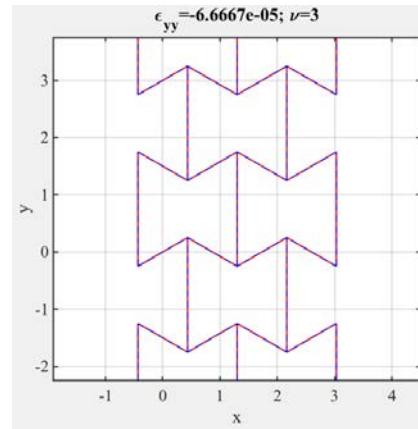
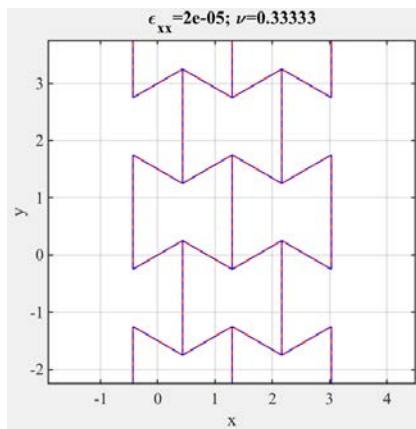


JIAWEI CHEN

GRADUATE STUDENT

University of California, Berkeley

- Research interests include robust numerical models and solution strategies for dynamic simulation, large-deformation models for novel structures, and energy efficiency of building façade systems.



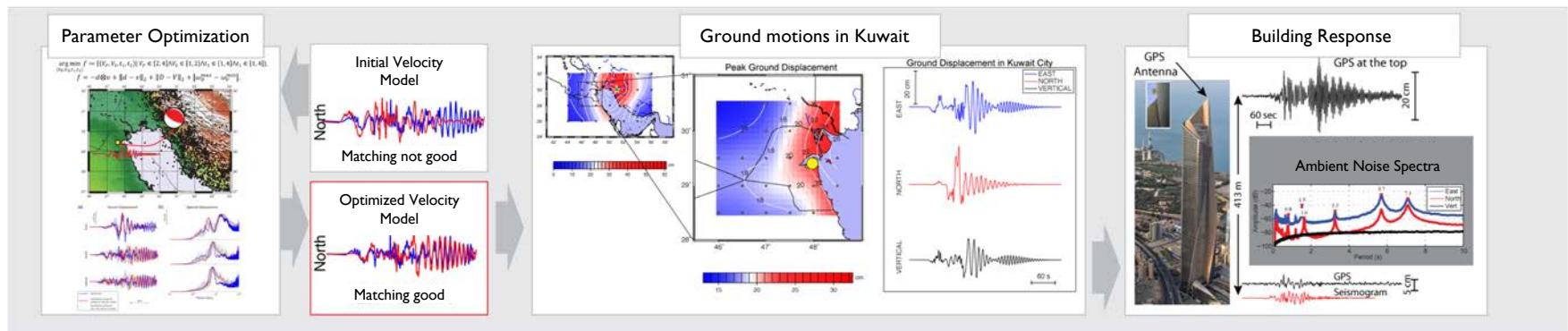
CHEN GU

POSTDOCTORAL ASSOCIATE

Massachusetts Institute of Technology

Fun fact: I made “earthquakes” in lab...

- My research focuses on the source physics of multi-scale earthquakes, including regional earthquakes, local earthquakes, micro-earthquakes, and pico-earthquakes in laboratory scale (acoustic emissions). I also worked on ground motion calculation due to significant tectonic earthquakes or induced seismicity, and assess the impacts of ground motions on tall buildings. What I will learn here can help me to develop innovative techniques to model the effects of seismic hazards on different structures.



YIJUN XIANG

GRADUATE STUDENT

University of California, Irvine

- My research is estimation of structural damping utilizing optimization methods.
- I've been using HPC from UCI to run my OpenSees models, but I've never learned bash systematically.
- Most of the time I used Matlab for coding, a little bit Python. I wish I can have a better understanding of different programming languages and work more efficiently with HPC.

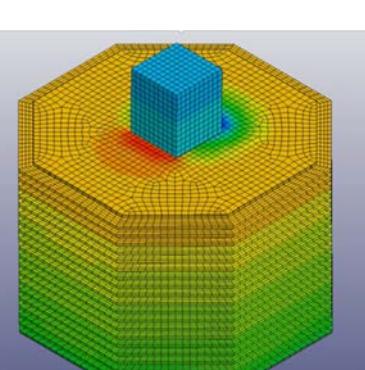
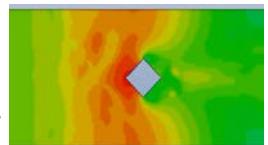
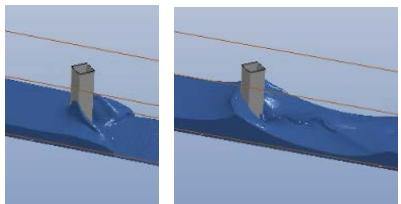
Fun fact: I've never had an advisor/boss pronounce my name properly.



DENIS ISTRATI

University of Nevada, Reno

- Main research interest in natural hazard engineering with focus on earthquakes and tsunamis. Research experience with (a) tsunami effects on coastal structures and mitigation strategies, (b) fluid-structure interaction, (c) computational fluid dynamics and (d) seismic soil-structure interaction



RESEARCH ASSISTANT PROFESSOR

Fun fact: If your jacket looks waterproof it might not necessarily be. Got my lesson in Japan during the monsoon period.



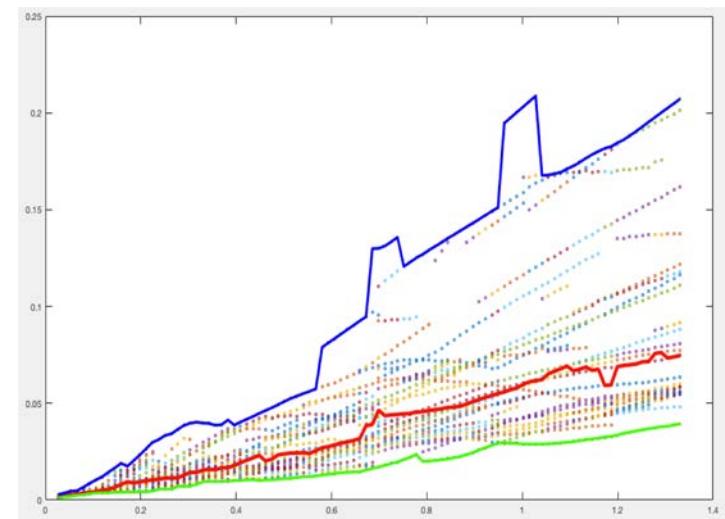
SILVESTRE CHAN ESQUIVEL

PH.D. STUDENT

Northeastern University, Boston, MA

- I am from Yucatán, Mexico (southeastern, near Cancún and Chichen Itzá).
- My research interests are structural reliability and resilience: How to design buildings based on community resilience goals and not only in safety requirements?
- Resilience is based on probabilities, therefore (a massive number of) nonlinear analysis of structures should be done to know their probabilities to achieve non functional states of damage.

Fun fact: Everybody call me Silvester the first time (at least)



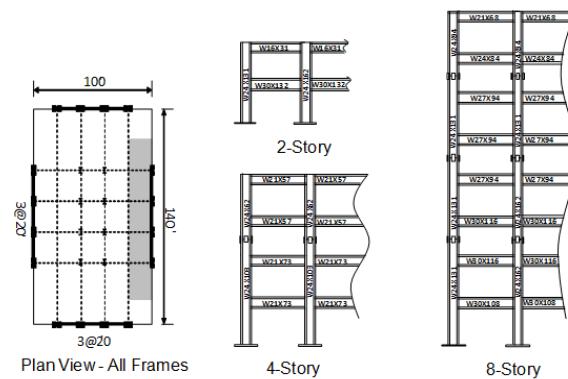
HUDA MUNJY

University of California, Irvine

- My research area is in performance based earthquake engineering with an emphasis in ground motion simulation validation for building structures. Although my bachelors masters and doctoral studies are all in civil engineering, I probably work more in the field of statistics than I do in engineering now. I plan to use what I learn in this workshop to be able to create more efficient programs for my work.

PHD CANDIDATE

Fun fact: My mother, father and grandfather are all civil engineers.



University of California at San Diego

Fun fact: a fan of **Game of Thrones**

- I am an engineer who likes Statistics and Bayesian point of view. I would be happy to explain what is the different between a Bayesian and frequentist!
- It was always amazing for me that how data talk about a phenomena, so I tried to learn data science and apply it in my engineering research.
- Uncertainty quantification in a Bayesian framework.
- To perform MCMC we need many sample and for computationally expensive model it is not feasible.



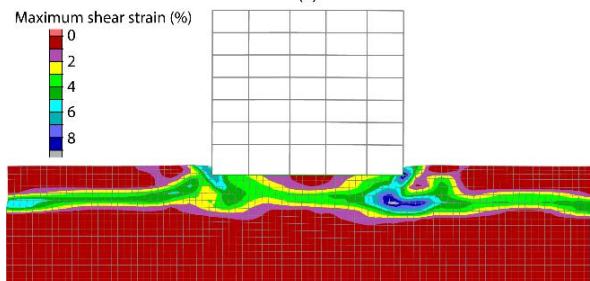
JORGE MACEDO

Georgia Institute of Technology

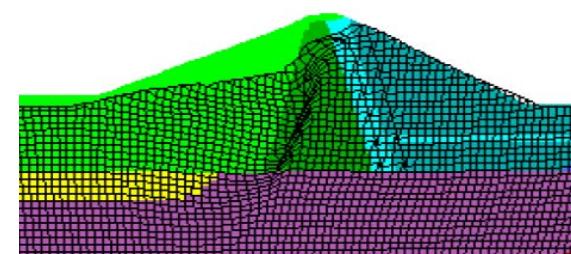
GEOSYSTEMS ENGINEERING

Fun fact: In a Starbucks most of the time I have to repeat my name (Jorge) when I order.

- I am originally from Peru, MS and Ph.D from UC Berkeley and currently starting as Assistant professor in Geosystems Engineering at Georgia Tech.
- My main research is in the areas of Numerical modelling (FEM/FDM/MPM), Risk and Reliability and Performance Based Engineering.
- I am excited to apply what I learn on the boot camp on my own research!



(Bray, Macedo, & Luque 2017)



ELIF ECEM BAS

DEVELOPMENT ON NEW EXPERIMENTAL TECHNIQUES BY USING
HYBRID SIMULATION

University of Nevada, Reno (UNR)

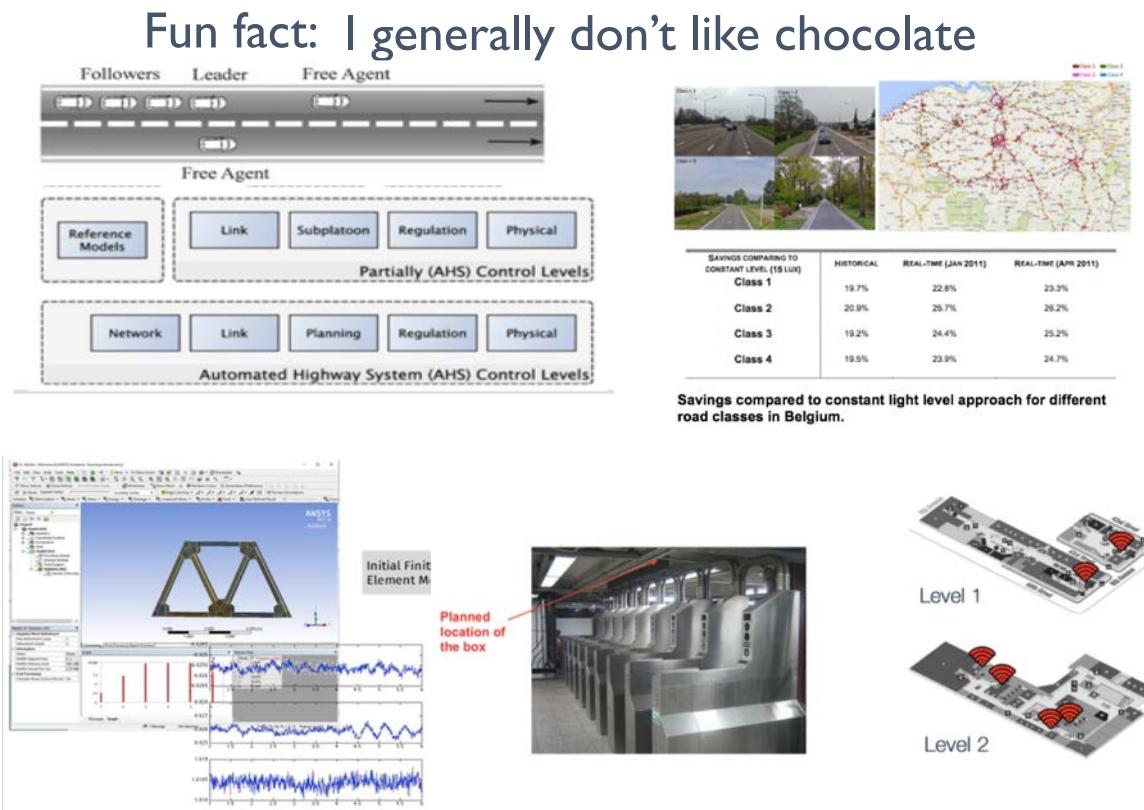
Fun fact: Tomorrow is my birthday 😊

- From Istanbul, Turkey. 1st year PhD student at UNR.
- Trying to improve new experimental techniques by using Hybrid Simulation with this small test setup.
- I would like to be more advanced in programming in order to have more control on my research.



The Cooper Union

- Research activities include state and parameter estimation techniques for real-time control of complex cyber physical systems applications in Intelligent transportation systems. Projects examples: communication and control architecture for connected vehicles, pedestrian detection and transit systems using Wi-Fi and bluetooth data, and adaptive lighting using macroscopic traffic model. I am currently interested in looking into the implications of the structural aspects on such systems and the appropriate software tools under extreme conditions!



Savings compared to constant light level approach for different road classes in Belgium.

