Damage Plasticity in Numerical Modeling of Reinforced Concrete Structures under Extreme Loading

The project investigates the use of damage plasticity concepts in the response simulation of reinforced concrete structures under extreme loads, especially earthquakes. A new numerical model for concrete has been developed and will be validated by comparing its results with experimental data to assess the accuracy and efficiency. The mentee will design and perform a series of numerical simulations of reinforced concrete structures to identify the capabilities and weaknesses of the model.

Thanh Do Ngoc
Ph.D. candidate, Civil and Environmental Engineering

Thanh Do Ngoc completed his undergraduate studies at University of the Pacific in 2012 with a major in Civil Engineering and a minor in Engineering Management. Do Ngoc then attended UC Berkeley and earned a Master's degree in Structural Engineering in 2013. He is currently a third-year graduate student in the Structural Engineering, Mechanics, and Materials program (SEMM) in the Department of Civil and Environmental Engineering. His research focuses on damage modelling and collapse simulations of structures and material constitutive model.

The SMART research serves as an important milestone of Do Ngoc's dissertation project. He considers the SMART program to be an excellent platform for him to pursue his passion for research and mentoring.

Victor Hakim
Sophomore, Astrophysics and Math

Victor Hakim is currently doing his undergraduate studies at UC Berkeley. As a sophomore, he intends to major in Astrophysics and Pure Math. He enjoys trying to explain how the world works and learning about new discoveries. He helps to organize activities as an officer of the Mathematical Undergraduate Student Association (MUSA) at UC Berkeley. Some of his favorite events are the high school and middle school math tournaments, such as the Berkeley Math Tournament.

With his summer SMART project, he hopes to learn numerical techniques as well as coding skills. He is excited to be experiencing research methods and discovering how to be a scientist.

UC Berkeley's Student Mentoring And Research Team (SMART) is a paid professional development program that engages doctoral students in creating mentored research opportunities conducted with selected undergraduate student mentees during a ten-week period over the summer. Both participants receive compensation and training throughout their participation. SMART broadens the professional development of doctoral students and fosters research skills and paths to advanced studies for undergraduates.

Expenses associated with each team total $10,000 000 ($5K graduate stipend/ $3.5K undergrad stipend/$1.5K research and conference costs). As a donor-supported program of the Graduate Division, the majority of teams are underwritten through a combination of donor funds paired with matching support courtesy of the Graduate Division.

Learn more at smart.berkeley.edu

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