Decision Analytics Integrating Simulations and Experiments

CLEMSON
College of ENGINEERING AND SCIENCE

Graduate Assistance in Areas of National Need

What are Model Validation and Data Analytics?

Model validation analytics is a field of study for experimentally validating physics-based computer models considering the inherent errors and uncertainties. Successful verification and validation of predictive models requires a strong team of theoreticians and experimentalists as well as mathematicians and statisticians to work together using a common language collectively producing, analyzing and manipulating large and complex data. In this project, we focus on the national need for model validation analytics in Civil and Environmental engineering problems.

Why Clemson University?

Clemson has become a leader in V&V research through the establishment of the Decision Analytics Integrating Simulations and Experiments (DAISE) center funded by the Department of Education's Graduate Assistance in Areas of National Need (GAANN) program. We are currently seeking eight Ph.D. students spanning four departments to develop their research and teaching skills in this collaborative research community.

Benefits to Fellows:

- Full tuition
- Competitive stipend (up to $34k)
- 5 years of guaranteed support

Encouraged Applicants:

- US citizens seeking Ph.D.
- Excellent academic record
- Demonstrate financial need
- Plan to pursue a research career (national laboratories or academe)

DAISE is an interdisciplinary program combining training and expertise from four departments:

- Civil Engineering
- Environmental Engineering & Science
- Mathematical Sciences
- School of Computing

CLEMSON UNIVERSITY

Interested? Contact:
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GAANN in Predictive Multiscale Models for Advanced Structural Materials

Description
This GAANN project aims at the development and experimental validation of predictive multiscale mechanics-based models for advanced structural materials, which are among the most commonly used materials in various modern engineering systems (e.g., ferritic low alloy steels and austenitic alloys in nuclear power plants, lightweighting metals in automobiles).

In particular, the doctoral fellows will focus on understanding and modeling the influence of heterogeneous microstructural attributes, such as the nucleation, growth and coalescence of microvoids, on the observed macroscopic material behavior. A predictive model requires such insights into microstructures and a mutiscale framework to propagate information across different scales. Moreover, as at the micro/meso scales, uncertainties, such as inherent material structure (morphology) variations or lack of understanding due to limited fine resolution experiments, cannot be ignored and mathematical techniques (uncertainty modeling, optimization) will play a key role in this research.

Through this project, the doctoral fellows will work with faculty mentors from Civil Engineering and Mathematical Science and have access to the state-of-the-art high performance computing facility at Clemson University. This fellowship guarantees five years of financial support. U.S. Citizenship or permanent residency is required for the fellowship; and students with underrepresented backgrounds are encouraged to apply.

Faculty Mentors
Sez Atamturktur (Civil Engineering)
Qiushi Chen (Civil Engineering)
Akshay Gupte (Mathematical Science)

Benefits to Fellows:
- Full tuition coverage
- Competitive stipend
- 5 years of guaranteed support

U.S. citizenship or permanent residency required.

Interested? Contact:
Dr. Chen (qiushi@clemson.edu) or Dr. Atamturktur (sez@clemson.edu)

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