Several PhD Research Assistant Positions Available at Multiscale Modeling and Simulation Center at Vanderbilt University

We are seeking several doctoral students to join the Multiscale Computational Mechanics Laboratory (MCML) at Vanderbilt University beginning either Spring 2023 or Fall 2023. The two broad research areas are briefly described below. Candidates must have a strong general interest (prior experience is a plus) in computational mathematics, mechanics, modeling and simulation and computer programming.

The specific research areas as follows:

(1) ***Computational Mechanics using Quantum Computers***: Quantum Computing (QC) and quantum information sciences are well positioned to revolutionize the world of modeling and simulation. This research will explore possibilities in developing efficient algorithms for classical continuum mechanics to be deployed in quantum computers. Students working in this area will be exploring a completely new nexus in computational mechanics. Previous class work or research work on quantum mechanics or quantum computing is desirable.

(2) ***Multiscale Modeling of Advanced Materials***: These research projects are on the development of manufacturing-process aware multiscale computational models for prediction of material and structural behavior from the scale of the unit cell to the component level. Areas of particular interest are (a) exploration of process-structure-property relationships of additively manufactured metallic materials in the presence of uncertainty; and (b) characterization of the effects of manufacturing induced residual stresses and defects on the performance of composite materials and structures. Students working on these projects will develop expertise on microstructure modeling, computational homogenization, materials science, manufacturing processes and continuum mechanics. Previous class work or research work on one or more of these areas are highly encouraged. US Citizenship or Permanent US residence is highly preferred.

Interested candidates should apply by email to Prof. Caglar Oskay (caglar.oskay@vanderbilt.edu) expressing the area(s) of interest and including an up-to-date CV. MCML has a strong commitment to recruiting and retaining an academically and culturally diverse research community. Minorities, women, and members of other underrepresented groups are highly encouraged to apply.

Ranked #14 nationally, Vanderbilt University is a private, internationally recognized research university located on 330 park-like acres 1.5 miles from downtown Nashville, Tennessee. Its 10 distinct schools share a single cohesive campus that values collaboration. The university enrolls over 13,500 undergraduate, graduate, and professional students, including 36% minority students and over 1,400 international students from 91 countries.

With a metro population of over two million people, Nashville's top industries by employment include trade, transportation and utilities; education and health services; professional and business services; government; and leisure and hospitality. Other industries include manufacturing, financial activities, construction, and information. Long known as a hub for health care and music, Nashville is a technology center with a considerable pool of health care, AI, and defense-related jobs available. In recent years, the city has experienced an influx of major office openings by some of the largest global tech companies and prime Silicon Valley startups.