MECHANICAL ENGINEERING SEMINAR ANNOUNCMENT

"Analysis, Design, and Diagnosis in Thermal Energy Systems"

Presented by: Forooza Samadi, Ph.D.

Date: Wednesday, March 6, 2024
Time: 11 A.M. – 12 P.M.
Location: BROWN 241

Abstract

In contrast to direct problems, which answer the question "given a set of inputs, what might be the expected outputs?", inverse problems address the question "given a set of observed outputs, what might have been the likely inputs?" In some thermal systems, some unknown boundary conditions or thermophysical properties have to be determined from the transient temperature measurements at an interior location. This talk highlights such problems that are called inverse heat transfer problems. Inverse problems' solution methods can be applied to a broad set of problems that mainly can be categorized as inverse design and inverse diagnosis problems. Inverse design can include boundary, material, and geometry design problems, while inverse diagnosis includes estimating a boundary condition, a thermophysical property, or an evolving geometry. My specific areas of interest include real time system identification and boundary condition estimation, and heat transfer enhancement as effective approaches to managing and optimizing thermal energy systems.

Biography:

Dr. Forooza Samadi is an Assistant Professor (Non-Tenure Track) at the ME Department of the University of Alabama (UA). She is the director of Alabama Building Training and Assessment Center (ABTAC) and the assistant director of Alabama Industrial Assessment Center (AIAC). She has published 18 peer reviewed papers, and she teaches Heat Transfer and Thermal Energy Survey as undergraduate courses and Intermediate Heat Transfer and Inverse Heat Conduction as graduate level courses at the UA ME department. Before joining the UA as a faculty member in 2022, she worked at Virginia Tech as a postdoctoral associate for one year. In her 7 years of AIAC experience, since she was a graduate student, she has been closely involved in more than 50 industrial energy assessments and mentoring undergraduate and graduate students. ABTAC and another project she has been involved with (Alabama Energy Transformation Initiative) are strongly focused on training students and workforce from underrepresented communities and helping these communities to reduce their energy consumption and use sustainable energy sources. She is a member of ASME and the Association of Energy Engineers (AEE), also serves on the ASME "K-6, Heat Transfer in Energy Systems" and "K-20, Computational Heat Transfer" committees, and at ASME and ASTFE conferences as a session chair.