

CIVIL AND ENVIRONMENTAL ENGINEERING SEMINAR ANNOUNCEMENT

Modeling the Societal Impact of Infrastructure Disruption

**Dr. Jessica Boakye, Assistant Professor,
University of Massachusetts Amherst,
Department of Civil and Environmental Engineering**

**Friday, Oct. 27
1:00 p.m. - 2:00 p.m.
COE Room B136**



**FAMU-FSU
College of
Engineering**

**This event
sponsored by
FAMU-FSU Engineering
Department of Civil & Environmental Engineering**

The impact of natural hazards is far-reaching and evident based on past disasters such as Hurricane Katrina (2005) and Super-storm Sandy (2012). The vulnerability of the nation's infrastructure can lead to significant physical damage which can translate into significant societal suffering. This societal suffering often outweighs the physical damage to infrastructure. However, traditional definitions of consequences are narrow and often limited to monetary loss. Since natural hazards are low frequency, high impact events, decision makers are reliant on engineering models to simulate disaster impacts. To mitigate these impacts, realistic models must be developed which can properly translate physical damage to infrastructure systems into societal consequences.

This talk introduces a Capability Approach (CA) for modeling hazard consequences on real communities. The creation of realistic digital twins is discussed as a way to simulate community consequences. A digital twin requires the collection and integration of data from the built, natural, and social environments. The CA allows for a more holistic definition of societal (or community) consequences that beyond monetary loss. The implementation of a CA within the context of engineering is illustrated through the failure of the transportation infrastructure. In particular, the creation of quantification metrics focusing on equity, resilience, and sustainability are discussed.



Dr. Jessica Boakye

**Assistant Professor
Civil and Environmental Engineering,
University of Massachusetts Amherst**

Dr. Jessica Boakye is an Assistant Professor of Civil and Environmental Engineering at the University of Massachusetts Amherst. She got her PhD in Societal Risk and Hazard Mitigation from the University of Illinois at Champaign-Urbana in 2020. Her work focuses on the holistic quantification of infrastructure failure due to shocks (e.g., hazards) and deterioration. In particular, the effect of damage to structural systems such as buildings and bridges are of interest. Additionally, the quantifying the societal impacts of deteriorating infrastructure on community well-being is of interest. She is especially concerned with the creation of equity, resilience, and sustainability metrics for communities and decision makers. Her work is interdisciplinary combining methods from philosophy, engineering, and risk analysis.