UF UNIVERSITY of FLORIDA

Two (2) postdoctoral research associate positions and three (3) graduate student positions at the University of Florida (UF)

The University of Florida is seeking applicants to fill 2 postdoctoral research associate and 3 graduate student positions. They will be part of a transdisciplinary project—in collaboration with Columbia University (CU) and East Carolina University (ECU)—entitled "Towards a Multi-scale Theory of Coupled Human Mobility and Environment Change." The project aims at applying a mixed-methods approach to develop a modeling framework that integrates environmental modeling, social dynamics, and migration theories and then to use such a modeling framework to develop an integrative theory of coupled dynamics of migration and environmental change. Some of the methods include dynamical system modeling, multilayer network approaches, climate and hydrological modeling, and Bayesian inference analyses. Different aspects of the project will be conducted across the three universities. The team will meet remotely on a regular basis and annual workshops will be held where all the team members will meet in person.

Applicants for the postdoc positions must demonstrate strong interest in transdisciplinary research and a PhD degree in natural sciences, social sciences, engineering, or related/relevant fields. Applicants for the graduate student positions must demonstrate strong interest in transdisciplinary research and a Master's degree in natural sciences, social sciences, engineering, or related/relevant fields; exceptional students with a Bachelor's degree plus research experience in an appropriate discipline will also be considered. Persons from groups under-represented in science and engineering are encouraged to apply.

Specifically for the positions at UF, the successful candidates should also possess some of the following qualifications: (i) strong mathematical background (especially in dynamical system modeling); (ii) strong background in network approaches; (iii) fluency in some programming languages; and (iv) open-mindedness and eagerness to learn from other disciplines. We explicitly specify the last qualification to reflect the importance of integration across disciplines in the project.

To provide the areas of expertise involved in this project, brief descriptions of the participating faculty's expertise are provided below.

Rachata Muneepeerakul (Principle Investigator, UF) is a complex systems modeler. His investigative methods include dynamical system modeling, network approaches, modeling coupled natural-human systems and modeling dispersal and evolutionary process in explicitly spatial settings.

Michael J. Puma's (CU) research is focused on global food security, especially understanding how susceptible the global network of food trade is to natural (e.g.,

megadroughts, volcanic eruptions) and man-made (e.g., wars, trade restrictions) disturbances using non-equilibrium, network based economic models.

Upmanu Lall's (CU) research links climate extremes, water, food and energy in a system modeling context. He brings expertise in Bayesian methods, systems modeling, machine learning and spatio-temporal modeling of extremes to the project.

David N. Griffith (ECU) has been studying migrant populations since 1981, including work on guest workers, undocumented economic migrants, and refugees fleeing civil war, natural disasters, and collapsing states and economies. His specific area of expertise related to this project is his work on the relationships among migration, environmental degradation, and economic development.

Jeffrey Johnson's (UF) work most related to this project focuses on network models of complex human and biological systems, and their integration, employing various applications of continuous time Markov chain and exponential random graph models to the study of trophic dynamics in food webs, particularly as it relates to the interplay between food web dynamics and human behavioral networks. He has also worked on understanding the drivers of conflict, both within and between human groups.

Rafael Muñoz-Carpena is an expert in uncertainty and global sensitivity analysis of complex models, especially complex hydrological and ecological models. His expertise in global sensitivity analysis will help determine the right level of complexity of the models.

More information about the project can be found at

http://abe.ufl.edu/carpena/research/MURI2018.shtml

Potential candidates for the UF positions are encouraged to learn more about the three UF investigators (Muneepeerakul, Johnson, and Muñoz-Carpena) and submit a CV, a cover letter, and three letters of recommendation to one of the three participating UF faculty. The e-mail addresses are as follows:

Dr. Rachata Muneepeerakul: rmuneepe@ufl.edu

Dr. Jeffrey Johnson: johnsonje@ufl.edu

Dr. Rafael Muñoz-Carpena: carpena@ufl.edu

The review process will start immediately. The positions will start as soon as June 1, 2018. The positions will stay open until they are filled.