UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

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Please see below for an announcement for an open postdoctoral research position in Computational Nonlinear Science in the Applied Dynamics Laboratory in the Department of Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign. Interested applicants should contact Harry Dankowicz by e-mail at danko@illinois.edu. Applications should include a complete curriculum vitae, a statement of research interests, and a list of five references.

Available: One-year, full-time, Post-Doctoral Research Position, renewable up to 2.5 years

Start Date: As soon as possible

Project title: Asynchronous Communication, Self-Organization, and Differentiation in Human and Insect Networks

Abstract: A post-doctoral researcher with expertise in computational network analysis, dynamic graph theory, and complex system modeling is sought to join a multidisciplinary, multiuniversity, NSF-funded research project on emergent dynamics and self-organized communication systems in human and insect networks.

The research program brings together expertise in engineering dynamics, cognitive psychology and linguistics, and entomology with high-reward implications for theories of human language and communication, self-organization and differentiation in complex communication systems, and social behavior in insect colonies. The project explores the question of how the activities of individuals become integrated into a smoothly functioning society— what are the dominant integrative mechanisms, how robust are they in the face of environmental change, and how do they depend on the properties of individual society members? To this end, the project targets the original development of a formal theory of parallel and asynchronous communication in complex human and insect networks; the development of computational algorithms able to identify differentiation of groups of network agents in the role their interactions serve in the overall communication system; and an experimental study of the implications of this framework for the robustness and resilience of such networks to perturbations. The project relies on integrating quantitative observations of the dynamic emergence of patterns of interaction and coordination in a beehive at unprecedented experimental resolution in time and space as well as in groups of humans under controlled and experimentally original conditions that seek to distinguish between failed and successful coordination. Informed by these complementary experimental contexts and by an innovative computational framework, the project aims to advance significantly the study of both animal behavior and human dynamics, as well as to make important new discoveries about complex systems in general.

For additional information on the relevant NSF award, see

http://nsf.gov/awardsearch/showAward?AWD_ID=1246920&HistoricalAwards=false

Sought qualifications: Preference is given to individuals with PhDs in Computational Science and Engineering, Computer Science, or Applied Mathematics with experience in algorithm development, large-scale data mining, and/or network analysis.

Illinois is an Affirmative Action/Equal Opportunity Employer and welcomes individuals with diverse backgrounds, experiences, and ideas, who embrace and value diversity and inclusivity (see www.inclusiveillinois.illinois.edu).

Application deadline: Applications may be submitted at any time.