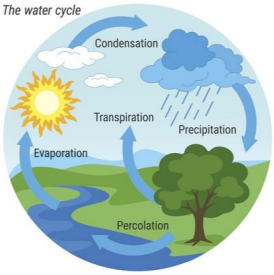
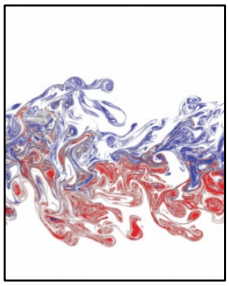
Boase Seminar Series in Hydrology and Water Resources Engineering

Department of Civil, Environmental and Architectural Engineering



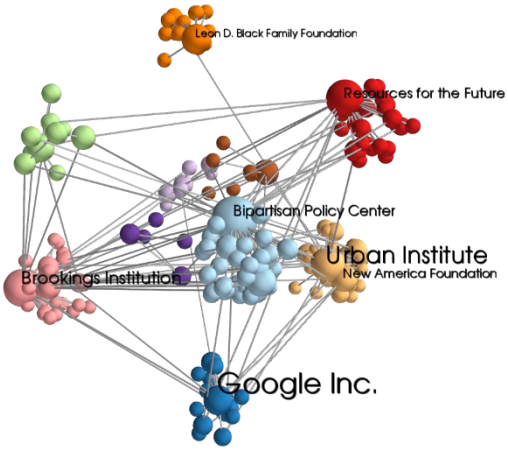


Complex Networks-based Analysis of Spatiotemporal Climate Data

Professor Nishant Malik
School of Mathematical Sciences
Rochester Institute of Technology
Rochester, NY

Wednesday, February 22, 2023 | 11:15 AM | ECCE 1B41 &
Zoom: https://cuboulder.zoom.us/j/98861379124
(passcode: water)

Abstract:



Network science is one of the most prominent theoretical frameworks in the modeling and analysis of complex systems. An ingenious application of network science is climate network analysis, where one provides data-driven insights into various dynamical phenomena of the global and regional climate systems. In this talk, I will show a few representative case studies of climate network analysis, focusing on South Asian and East Asian rainfall and presenting methods that can identify insightful spatial structures and patterns in the rainfall field. I will also present a recent extension to this analysis where we propose a climate networks-based data-driven algorithm that relies on historical reanalysis of climate fields to predict the South Asian monsoon.

Speaker Bio: Nishant did his Ph.D. at the Potsdam Institute for Climate Impact Research in Germany under the supervision of renowned mathematical physicist Juergen Kurths. Subsequently, the Physical Society of Berlin awarded him the Carl Ramsauer Prize in 2012 for his Ph.D. work. Before joining RIT, he worked as a postdoc at Dartmouth College and UNC-Chapel Hill. Nishant has a wide range of research interests in data-driven analysis and modeling of complex systems. In his research, he employs tools from network science, the theory of nonlinear and stochastic dynamical systems, and applied statistics and enjoys working on mathematical problems across disciplines in natural and social sciences.