DEPARTMENT OF COMPUTER SCIENCE
University of Houston

SEMINAR SPRING 2013

WHEN: **MONDAY, FEBRUARY 25, 2013**
WHERE: **PGH 232**
TIME: **11:00 AM**

SPEAKER: Dr. Mauro Martino, Northeastern University

Host: Dr. Ioannis Pavlidis

TITLE: Network, Visualization and Society

ABSTRACT:
  Over the past decade, the development of digital networks and operations has produced an unprecedented wealth of information. Handheld electronics, location devices, telecommunications networks, and a wide assortment of tags and sensors are constantly producing a rich stream of data reflecting various aspects of urban life.

  This presentation discusses the visualization design process of interactive tools for that analysis of human mobility. I present five main projects:

  In the **"Ocean of Information"** project we propose a tool to explore human movement dynamics in a metropolitan area in the United States. By analyzing individual cell phone traces, we build a Human-City Interaction System for understanding urban mobility patterns at different user-controlled temporal and geographical scales. Our tool is built to support the exploration and discovery of urban mobility patterns and the daily interactions of millions of people.

  The **"syn(c)ity"** project illustrates the potential of a predictive, in-car recommendation system based on the real-time profiling of both the city and the driver. It connects analysis of the driver's behavior and personal preferences with geographical data from the current location to successfully identify the set of activities relevant to the driver's intentions.

  "Obama | One people" is an unprecedented analysis of Barack Obama's Inauguration Day on January 20, 2009. In partnership with AT&T Labs, we created visualizations of mobile phone call activity that characterize the inaugural crowd and address the questions: Who was in Washington, D.C. for President Obama's Inauguration Day? When did they arrive, where did they go, and how long did they stay?

  "VisPolitics" brings together great political content and visualizations; we create distinct genres of politic data visualizations that are at once comprehensive, analytical, and graphically arresting.

  "Cactus Project - Controllability of Complex Networks"; how to control a complex network with minimum number of nodes? For a given directed network, we calculate its maximum matching: a largest set of edges without common heads or tails. From it we identify the minimum set of driver nodes to control. By injecting signals to those driver nodes, we can fully control the network. There is a "cactus" structure underlying the controlled network, which is the "skeleton" for controllability.

BIO:

Mauro Martino is an *Artist / Designer / Researcher* focusing on the representation of network of human interactions. He has been collaborating with leading commercial research and development laboratories, including *Clarion*, based in Tokyo, Japan. Mauro was a research affiliate with the SENSEable City Lab at *Massachusetts Institute of Technology (MIT)* in Boston, working on data visualization and his related research project, *Urban Interaction Design*.

Mauro is currently a Assistant Research Professor with *Albert-László Barabási* at *Center for Complex Network Research* and with *David Lazer* and Fellows at *The Institute for Quantitative Social Science (IQSS)* at Harvard University in Boston.

He has developed a long experience in the visualization and exploration of massive amount of human mobility data, while working with different databases from different mobile operators (*Airsage - AT&T - BT - Orange – Sprint – TDC - Telecom Italia*) and in different nations (Belgium, Denmark, England, France, Italy, USA).

His projects have been shown at international festivals including *Ars Electronica*, TEDx Cambridge THRIVE, and Art Galleries including *The Serpentine Gallery* (London), *GAFTA* (San Francisco).

Mauro Martino is a PhD in Design and Technologies at Politecnico di Milano, Italy.