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Maxwell Room 5th Floor DET
Corso Castelfidardo, 42/a

Ciro Cattuto

ISI Foundation



High-resolution social networks

ABSTRACT

Digital technologies provide the opportunity to quantify specific human behaviors with unprecedented levels of detail and scale. Personal electronic devices and wearable sensors, in particular, can be used to map the network structure of human close-range interactions in a variety of settings relevant for research in computational social science, epidemiology and public health. This talk will review the experience of the SocioPatterns collaboration, an ongoing international effort aimed at measuring and studying high-resolution human social networks using wearable proximity sensors. We will discuss technology requirements and measurement experiences in diverse environments such as schools and hospitals, including recent work in low-resource rural settings in Africa. We will illustrate the network structures observed in empirical data, reflect on challenges such as generalization and data incompleteness, and review modeling approaches based on ideas from network science, epidemiology and computer science. We will close with an overview of future research directions and applications.

BIOGRAPHY

Dr. Ciro Cattuto is the Scientific Director of ISI Foundation (Torino, Italy and New York City, USA). He founded the Data Science Laboratory of ISI Foundation, where his research focuses on measuring, understanding and forecasting complex phenomena in systems that entangle human behaviours and digital platforms. Dr. Cattuto is a founder and principal investigator of the SocioPatterns collaboration, an international effort on measuring and analyzing human and animal social networks with wearable sensors. Dr. Cattuto holds a PhD in Physics from the University of Perugia, Italy and has carried out interdisciplinary research at the University of Michigan in Ann Arbor, USA, at Sapienza University in Rome, and at the Frontier Research System of the RIKEN Institute in Japan. He is an adjunct professor at the University of Torino and at Sapienza University, an editorial board member of the EPJ Data Science, PeerJ Computer Science and Nature Scientific Data journals, and has been an organizer, program chair and track chair of several leading conferences in Computer Science, Network Science, Complex Systems and Digital Epidemiology.

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