

February 2016 Complexity Community Sharing Session

3 Feb 2016 (Wed) 11:00am-01:00pm
Seminar Room 102

(opposite Learning Hub), Blk 1 Innovation Centre, Level 1
16 Nanyang Drive, Singapore 637722



Ms. Sorina Costache Litescu



Dr. Virgil Griffith

Information Impact on Transportation Systems

New advancements in Intelligent Transportation Systems and navigation devices enable commuters to access traffic recommendations and provide data about their trips in real time. This creates a feedback loop that can have significant consequences on the system performance. My talk presents our findings on the effect of real time information propagated into transportation systems. We study whether disseminating information about possible problems (e.g. congestion awareness details) can be detrimental to the overall system performance. In some situations, using models of information dissemination can steer the transportation system towards better performance. This has important implications on how future Intelligent Transportation Systems are built and how information is presented to traffic participants on the navigation devices.

Biography: Sorina is a PHD student of a joint programme by Technische Universität München (TUM) & NTU at TUM CREATE to research on "Information Dynamics and Performance Analysis in Human Complex Networks. Using complexity concepts to investigate urban environments and applying them on the transportation systems, she studies the real-time information effect on human behaviour in complex networks to see if information as a tool can steer systems towards better performances. She uses information theory, networks theory & an agent based simulation of the traffic network as methodology. Previously, she was with ETH Zurich & Future Cities Laboratory in Singapore to explore & construct adaptive models for data processing in urban design.

Understanding and quantifying synergy in information theory

Synergy is a fundamental concept in complex systems that has received much attention in computational biology. Using information theory, we provide a rigorous definition of synergy and irreducibility as well as a compute it for some simple systems. Computing synergy for arbitrary systems remains an open problem, but the lower and upper bounds tighten each year.

Biography: Dr. Virgil Griffith received his doctorate from the California Institute of Technology studying synergistic computation in neural works. His research interests focus on the Information Integration Theory of Consciousness. His goal is to expose corruption, curb abuses of power, and with "gloves off" ensure the digital age never becomes a digital dystopia. As a tech entrepreneur, Dr Virgil is working in the spaces of The Tor Project, data-science, and bitcoin. Previously he was scientist at Caltech researching neural complexity. For his full biography, please visit: <http://virgil.gr/>