

IEEE Communications Society Distinguished Lectures 2017
Toronto, Ottawa, Montreal, Quebec City

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Lecture 1:

Title: " Topology Preserving Maps: A Localization-Free Approach for 2-D and 3-D IoT Subnets,"

Sponsor: IEEE Toronto Section and University of Toronto

Venue: University of Toronto

Date: 2:00-4:00 PM, June 13, 2017

Contact: Eman Hammad, eman.hammad.ca@ieee.org

(More information at <https://events.vtools.ieee.org/m/45777>)

The lecture was attended by ~30 attendees from industry and academia, including researchers working on related topics.

Abstract: Driven by higher potency and lower cost/size of devices capable of sensing, actuating, processing and communicating, the Internet of Things and of Everything promises to dramatically increase our ability to embed intelligence in the surroundings. Subnets of simple devices such as RFIDs and tiny sensors/actuators deployed in massive numbers in 2D and complex 3D spaces will be a key aspect of this emerging infrastructure. Most techniques for self-organization, routing and tracking in such networks rely on distances and localization in the physical domain. While geographic coordinates fit well with our intuitions into physical spaces, their use is not feasible in complex environments. Protocols based on geographical coordinates do not scale well to 3D either. We present a novel localization-free coordinate system, the Topology Coordinates (TC). Interestingly, geographic features such as voids and shapes are preserved in the resulting Topology-Preserving Maps (TPMs) of 2-D and 3-D networks. Ability to specify virtual cardinal directions and angles in networks is a radical change from the traditional approaches. A novel self-learning algorithm is presented to provide network awareness to individual nodes, a step toward large-scale evolving sensor networks. Application of TCs to social networking will be illustrated.

Lecture 2:

Title: " Topology Preserving Maps: A Localization-Free Approach for 2-D and 3-D IoT Subnets,"

Sponsor: IEEE Ottawa Section

Venue: Ciena-Optophotonics Lab, School of Advanced Technology, Algonquin College, Ottawa

Date: 6:00-8:00 PM, June 14 2017

Contact: Wahab Almuhtadi (walmuhtadi@yahoo.com)

The lecture attendance was quite small (<10) but there was lot of interaction and discussion, with presentation lasting over 90 minutes. The attendees included people from industry and academia.

Lecture 3:

Title: " Topology Preserving Maps: A Localization-Free Approach for 2-D and 3-D IoT Subnets,"

Sponsor: IEEE Communications Society Montreal Section and Concordia University

Venue: Electrical & Computer Engineering Department, Concordia University, Montreal

Date: 6:00-8:00 PM, June 15 2017

Contact: Dr. Anader Benyamin-Seeyar <anader.benyamin@gmail.com>

(More information at <http://montreal.ieee.ca/event/topology-preserving-maps-a-localization-free-approach-for-2-d-and-3-d-iot-subnets/>)

The lecture attendance was ~10. There was lot of interaction and discussion, with presentation lasting over 90 minutes and extended to speakers research topics as well. The attendees included people from industry and academia.

Lecture 4:

Title: "IoT: A Pervasive Technology for Innovation"

Sponsor: IEEE Quebec City and Laval University

Venue: Adrien-Pouliot building

Date: 11:00-12:00AM, June 16 2017

Contact: Dr. Paul Fortier <paul.fortier@gel.ulaval.ca>

The presentation was attended by over 30 participants. It was well received with significant time spent on Q&A and audience comments. Although it was meant to be a general talk on IoT, a number of questions from the audience were related to presenters research as well.

Abstract: The emergence of Internet of Things, and of Everything, is enabling network based integration pervade into all aspects of engineering and social systems. Driven by lower cost and size, and higher potency and efficiency of devices capable of sensing, actuating, processing and communicating, the IoT promises to dramatically increase our ability to embed intelligence in things and in the environment, and thus alter the way systems are implemented and evolve. Ubiquitous Internet access allows the utilization of cloud resources on demand for processing as well as storage of IoT information for learning and analytics. The evolution of this new internet landscape will be considered with focus on technologies that bridge the gap between physical and digital worlds, including networking standards, hardware platforms, software and research challenges. A novel coordinate space will be presented for self-organization of large-scale IoT. A range of applications will be considered to provide a perspective of Internet of Things and address how these technologies can be exploited to design the next generation integrated systems.