

## IEEE Communications Society Distinguished Lectures 2017 Portland OR and Seattle WA

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### IEEE CommSoc Distinguished Lecture 1:

Title: "Topology Preserving Maps: A Localization-Free Approach for 2-D and 3-D IoT Subnets,"  
Sponsor: IEEE Oregon Section  
Venue: Tektronix Bldg. 38, Beaverton, OR  
Date: 6:00-8:15 PM, April 10, 2017  
Contact: Pradeep Kumar <pradeep@ieee.org>  
(More information at [https://meetings.vtools.ieee.org/meeting\\_view/list\\_meeting/44642](https://meetings.vtools.ieee.org/meeting_view/list_meeting/44642))

The lecture was attended by ~40 attendees from industry and academia. Based on interaction with the audience during the reception prior to the lecture, ~70% of the presentation was devoted to the general topic of Internet of Things, with remainder focusing on topology preserving maps. The presentation was very interactive with significant audience participation. Abstract: 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 Internet of Things. 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 harsh environments and in complex deployments. 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.

### IEEE CommSoc Distinguished Lecture 2:

Title: "Topology Preserving Maps: A Localization-Free Approach for 2-D and 3-D IoT Subnets,"  
Sponsor: IEEE ComSoc, Seattle Chapter  
Venue: Microsoft, Bldg 99, 14820 Northeast 36th Street, Redmond, 98052  
Date: 6:00-7:00 PM, April 11, 2017  
Contact: Titus Lo <titus.lo@ieee.org>  
(More information at <http://sites.ieee.org/seattle/event/topology-preserving-maps-a-localization-free-approach-for-2-d-and-3-d-iot-subnets/>)

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In addition to the lecture, interacted with a number of ComSoc members who were working on IoT related research, teaching and product development.