Geometry of Networks: Past Twenty Years and New Challenges

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Stony Brook

2/25/2019 at 10:30 am
CoRE A 301

Abstract

We take a geometric perspective to study networks that come from the physical world, such as the wireless and sensor networks, as well as mobile and social networks. I will use a chronological order to review geometric algorithms we have developed for network management and analysis for the last two decades. Examples include network localization, geometric routing, distributed information storage and query, geometric optimization for motion planning and scheduling, as well as analysis of Internet topology and understanding social contagions. I will then introduce our recent work on new challenges on privacy from human trajectories and social ties, brought by pervasive IoT devices, big data, and social platforms.

Bio

Jie Gao is Professor of Computer Science at Stony Brook University. She received BS from the special class for the gifted young program at University of Science and Technology of China in 1999 and Ph.D in computer science from Computer Science department, Stanford University in 2004. She received the NSF Career award in 2006, IMC best paper award in 2009, and multiple awards at Stony Brook CS department on Excellence in Research and Teaching. She has published over 120 referred papers in computer networking and theoretical computer science, and has graduated 14 Ph.D students. She co-chaired the ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN), 2018. She is currently serving on the editorial board of ACM Transactions on Sensor Networks and IPSN Steering Committee. She has also served on the editorial board of IEEE Transactions on Automation Science and Engineering and Journal of Discrete Algorithms.

Faculty Host: Fred Roberts (DIMACS)