Greedy Routing with Guaranteed Delivery Using Ricci Flow

by Jie Gao, Stony Brook University

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About the Speaker

Jie Gao is currently an assistant professor in the Department of Computer Science at Stony Brook University. She received Ph.D. from Computer Science department, Stanford University in 2004, and B.S. from the special class for the gifted young, University of Science and Technology of China in 1999. She works on algorithms, sensor networks, and computational geometry. She received NSF CAREER award in 2006, the best paper award from Internet Measurement Conference 2009, and she is currently an associate editor of ACM Transaction on Sensor Networks.

About the Talk

Greedy forwarding with geographical locations in a wireless sensor network may fail at a local minimum. In this talk, we propose to use conformal mapping to compute a new embedding of the sensor nodes in the plane such that greedy forwarding with the virtual coordinates guarantees delivery. In particular, we extract a planar triangulation of the sensor network with non-triangular faces as holes, and deform the network shape by using Ricci flow such that all the non-triangular faces are mapped to perfect circles. Thus, greedy forwarding will never get stuck at an intermediate node. The computation of the conformal map and the virtual coordinates is performed at a preprocessing phase and can be implemented by local gossip-style computation.

This is joint work with Xianfeng David Gu, Feng Luo, Rik Sarkar, Xiaotian Yin, and Wei Zeng.

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For more information contact Nirwan Ansari (973)596-3670 or Yanchao Zhang (973)642-7817. Check **http://web.njit.edu/~ieeenj/comm.html** for latest updates. Directions to NJIT can be found at: **http://www.njit.edu/about/visit/gettingtonjit.php**.