Illinois Center for Wireless Systems

ICWS Seminar Series

EQUALITY COMPUTATION AND DISTRIBUTED BYZANTINE CONSENSUS

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Abstract: (Joint work with Guanfeng Liang)

We consider a point-to-point network wherein each node has an input value. The equality function determines whether the inputs at all the nodes the network are equal or not. In this talk, we will discuss two versions of the equality problem, and present solutions for these. In the first version of the problem, the goal is to minimize the total communication cost of equality computation. In the second version of the problem, the goal is to maximize the throughput of equality computation, as a function of the capacities of the links in the point-to-point network.

It turns out that the equality problem is closely related to the problem of achieving consensus in the presence of Byzantine faults. Byzantine fault model allows the faulty nodes to misbehave arbitrarily. The goal of Byzantine consensus is to allow the fault-free nodes to reach agreement on a suitable decision (as a function of their inputs), despite the presence of the Byzantine nodes. We will present an algorithm for consensus that can achieve throughput within a factor of 1/2 of the maximum achievable (i.e., capacity of consensus).

Biography: Nitin Vaidya is a professor of ECE at UIUC. His research interests include distributed algorithms and wireless networks.

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