

**Talk Title: An Approach to Identifying Beneficial Collaboration Securely in  
Decentralized Logistics Systems**

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**Venue:** 209, Comp. Sci. Bldg

**Time:** Nov' 11<sup>th</sup> Tuesday, 12:30 to 1:30pm

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**Abstract:**

The problem of sharing manufacturing, inventory or capacity to improve performance is applicable in many decentralized operational contexts. However, solution of such problems commonly requires an intermediary or a broker to manage information security concerns of individual participants. Our goal is to examine use of cryptographic techniques to attain the same result without the use of a broker. To illustrate this approach, we focus on a problem faced by independent trucking companies that have separate pickup and delivery tasks and wish to identify potential efficiency enhancing task swaps while limiting the information the companies must reveal to identify these swaps. We present an algorithm that finds opportunities to swap loads without revealing any information except the loads swapped, along with proofs of the security of the protocol. We also show that it is incentive compatible for each company to both follow the protocol correctly as well as provide their true data. We apply this algorithm to an empirical dataset from a large transportation company and present results that suggest significant opportunities to improve efficiency through Pareto improving swaps.