

Industrial & Systems Engineering

Seminar Announcement

## HOLA: Heuristic and Opportunistic Link Selection Algorithm for Energy Efficiency in Industrial Internet of Things (IIoT) Systems

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**Abstract:** Internet of Things (IoT) promises to be a key enabler in Smart Manufacturing and Smart Supply Chain. The IoT systems are responsible for enabling and improving the operational efficiencies of factories, plant floors, including assembly plants. These systems are characterized by reliable sensing and reporting of multiple parameters within the factory floor. Such sensing activities offer safe, efficient and optimized performance of not only the machines manufacturing the products, but also the workforce operating them. Industrial IoT (IIoT) systems could suffer from high and uneven energy consumption due to the nature of the network deployment. Such behavior is unacceptable as it not only increases the carbon footprint of the plant, but also makes the planned maintenance of IoT devices for battery replacement a huge challenge.

In this talk, we propose a heuristic and opportunistic link selection algorithm, HOLA, which not only reduces the overall energy consumption of the IoT network but also balances it across the network. HOLA achieves this energy-efficiency by opportunistically offloading the IoT device data to smart-devices being carried by the workforce in the factory settings. Further, these smart-devices with multiple radio links such as Bluetooth, Wi-Fi, and 3G/4G LTE heuristically determine the best link to transmit the data to the Cloud based on the quality and energy cost of the link. Our experimental and simulation studies validate that HOLA can improve the energy efficiency of IoT systems by reducing the overall energy consumption and balancing it across the network.

**Bio:** *Jeffrey D Tew, PhD* is the Chief Scientist for the TCS Innovation Lab in Cincinnati, OH whose focus is leading and developing TCS's Supply Chain Research and Innovation activities globally. Dr. Tew is an internationally known professional consultant, industrial researcher, and subject matter expert in Transportation and Supply Chain Management (SCM), global logistics, Green Supply Chain design (e.g., low energy and low environmental impact) and execution, and service parts management with over 25 years' experience in industrial research in such areas as Transportation and Supply Chain Management, business development, technology implementation, and corporate strategy. Dr. Tew received his BS in Mathematics, MS in Applied Statistics, and PhD in Operations Research from Purdue University.

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**1:30 - 2:20 p.m.**  
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