FLORIDA ATLANTIC UNIVERSITY

FREIGHT MOBILITY RESEARCH INSTITUTE (FMRI)

A USDOT University Transportation Center

The FMRI and ITE Student Chapter at FAU Presents:

Locating Platforms and Scheduling a Fleet of Drones for Emergency Delivery of Perishable Items*

* Joint research with Monica Gentile and Alessandro Agnetis

Lecture Presentation By,

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Abstract: Just as emergency public safety systems, such as ambulance, fire protection, and police, which are road-network based, with associated traffic management protocols and logistics support systems that have been designed and developed over the last half century, we have been developing complementary emergency systems that are airborne, primarily using helicopters, for emergency humanitarian assistance, for example search-and-rescue missions, delivery of emergency goods, and emergency medical assistance. Given the rapid developments in drone technologies, this talk argues that drones and associated logistical systems can cost-effectively address some problems of emergency delivery of medicine to patients that are remote and not easily accessible via roads from medical facilities and medicine inventories. We address the following problem and extensions. We have p delivery drones to serve m remote demand points that need delivery of emergency medical supplies such as blood units. These demand points are reachable only by drones where each of the drones is constrained by a limited distance range to service a demand point. The drones operate out of mobile platforms, which may be moved on useable roads. Each demand point requires a single package of product whose utility decreases with delivery time due to product perishability. Furthermore a customer's demand may have a delivery time deadline. The main problem addressed is to locate p platforms, and their associated drones, so that the total disutility for delivery times is minimized.

Presenter Bio: Dr. Mirchandani [UCLA, BS/MS in Engineering; MIT, SM (Aero and Astro) ScD in Operations Research] is a Professor of Computing, Informatics, Decision Systems Engineering and the AVNET Chair for Supply Chain Networks. He is the Director of the Advanced Traffic and Logistics Algorithms and Systems Laboratory (ATLAS), the Chief Scientist of the DHS Center for Accelerating Operations Efficiency, and a Senior Scientist at ASU's Global Institute of Sustainability. Mirchandani has been studying Dynamic Stochastic Networks, with interests in models and systems for making strategic/tactical/operational decisions in stochastic networked environments, with applications typically related to transportation and logistics. He is a Fellow of INFORMS and Fellow of IEEE.

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