

Innovative Uses of Drones for Last Mile Delivery with a Focus on Healthcare

ABSTRACT - This seminar discusses a novel strategy for employing a combination of drones and delivery vehicles, such as trucks, for last mile delivery to homes and businesses. This strategy uses drones to resupply trucks during the day for same day delivery, as orders are made available at a central depot. The trucks deliver the orders to the customers but do not have to return to the depot during the day since they are being supplied by the drones for new orders. A mathematical model is formulated and solved for this strategy. Both deterministic demand and stochastic demand scenarios are considered. We show that this strategy offers benefits in customer service and cost of delivery compared to traditional truck delivery only. We focus our work on healthcare and specifically the delivery of medical supplies and tests in underserved rural environments. We are complementing our algorithmic and computational work with animations and a limited physical field trial. This work has been partly sponsored by the Toyota Company and the Raymond Company.



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SPEAKER BIO – ALICE E. SMITH is the Joe W. Forehand/Accenture Distinguished Professor of the Industrial and Systems Engineering Department at Auburn University, where she served as Department Chair from 1999-2011. She also has a joint appointment with the Department of Computer Science and Software Engineering. Previously, she was on the faculty of the Department of Industrial Engineering at the University of Pittsburgh from 1991-99, which she joined after industrial experience with Southwestern Bell Corporation. Dr. Smith has degrees from Rice University, Saint Louis University, and Missouri University of Science and Technology.

Dr. Smith is a Life Fellow of the Institute of Electrical and Electronics Engineers (IEEE), a Fellow of the Institute for Operations Research and Management Science (INFORMS) and the Institute of Industrial and Systems Engineers (IISE), and a senior member of the Society of Women Engineers, a member of Tau Beta Pi, and a Registered Professional Engineer. She is a current IEEE Distinguished Lecturer and an INFORMS Official Speaker. She has served as Chair of the Council of Industrial Engineering Academic Department Heads and as President of the INFORMS Association of Chairs of Operations Research Departments. She has given numerous keynote addresses including at the International INFORMS Conference (2019) and at the IEEE World Congress on Computational Intelligence (2018). She was named a 2020 Yellowhammer Women of Impact (20 women are honored each year in the State of Alabama <https://alabamawomen.org/#2020>) and was an INFORMS Diversity, Equity, and Inclusion Ambassador in 2021.