**UAV-Assisted Delivery System**

**Team Members:**

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**Ideas:**

* Unmanned aerial vehicles (UAVs) are used in our project, UAV-Assisted Delivery Simulation, to mimic a drone delivery network in a specified urban area (i.e, Denton).
* We combine complex graph theoretical techniques, including the Dijkstra and A\* algorithms, to handle logistical problems in real time, like delivery scheduling, collision avoidance, and route optimization. In a controlled simulation environment, nodes representing stores, consumers, and charging stations are put up using the actual geographic structure of Denton, Texas.
* Our project's goals are to reduce operational costs by using strategic path planning to optimize UAV routing, improve delivery dependability, and comply with regulatory requirements.

**Connection to Computer Algorithms Class:**

* The use of graph theory and algorithm design fundamental elements of our algorithm studies is at the heart of our endeavor.
* We take advantage of the A\* algorithm's effectiveness in locating the shortest path, combining heuristic methods with useful traversal techniques to successfully negotiate intricate urban environments.
* The shortest path tree from one point in the network to every other point is constructed with the aid of Dijkstra's algorithm, and this is essential for dynamic delivery scheduling and rerouting in response to variables that change in real-time, like battery levels or no-fly zones.
* We show the usefulness of the theoretical ideas covered in class by integrating these algorithms into our simulation, offering a concrete way to assess algorithm performance and flexibility in real-world situations.

**References:**

Khosravi, M., Enayati, S., Saeedi, H., Pishro Nik, H. (2021). Multi-purpose drones for coverage and transport applications. IEEE Transactions on Wireless Communications, 20(6), 3974-3987.

Sohail, M. F., Leow, C. Y., & Won, S. (2019). Energy-efficient non-orthogonal multiple access for UAV communication system. IEEE Transactions on Vehicular Technology, 68(11), 10834-10845.