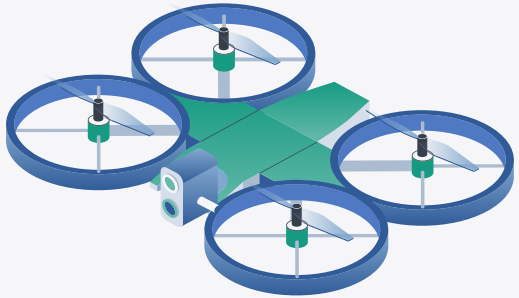

AIRSIM LIDAR MAP PROJECT

Edwin Zheng & Kalvin Weng

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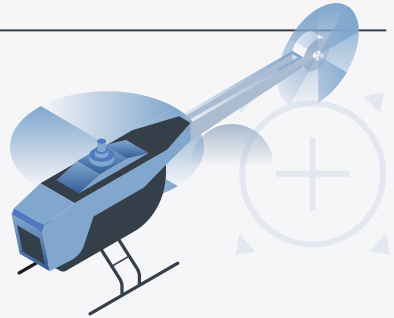
01

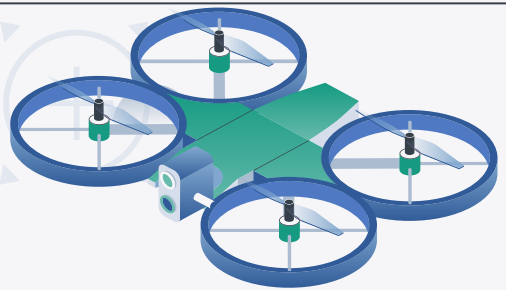
Problem

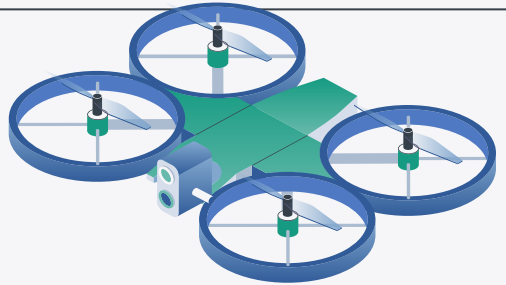
Problem



Search and Rescue missions often take place in hazardous and unpredictable environments with limited time and resources.

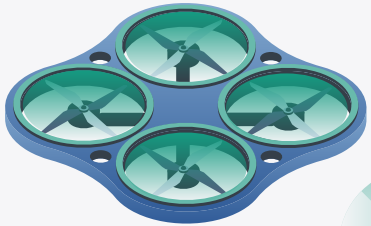
1. Limited Resource
2. Dangerous
3. Time Sensitive

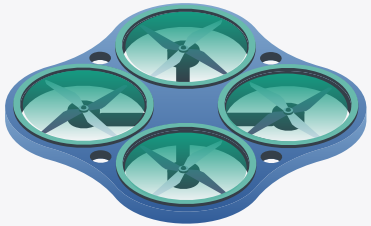




Emerging Platform: App Specificity

UAVs

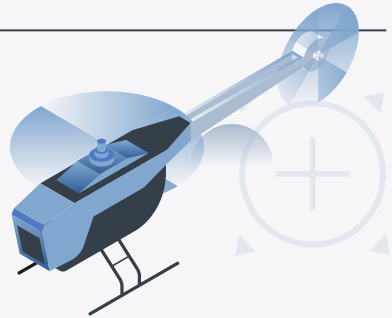




03

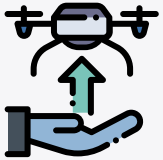
SOLUTION

Solution



Problems	Solutions
Limited Resource	↬ Multiple drones to overcome lack of manpower ↬ Sensors to provide additional functions: LiDAR
Dangerous	↬ Drones are cheap & disposable
Time-Sensitive	↬ Add Real-time functionality ↬ Greater mobility

TOOLS

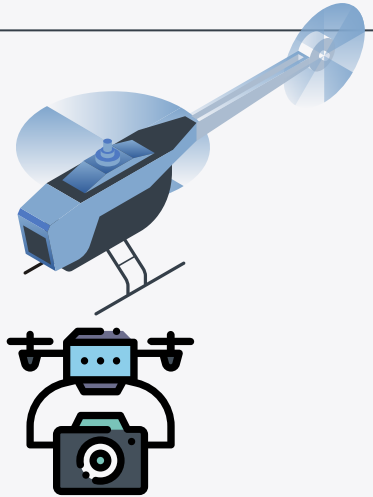


MICROSOFT AIRSIM

Drones + LiDAR

UNREAL ENGINE

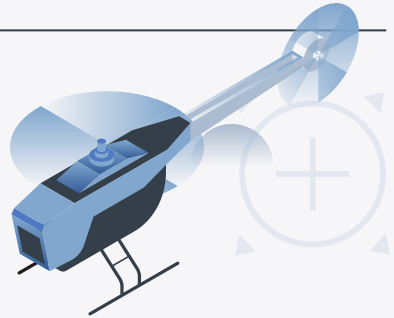
Environment Simulator



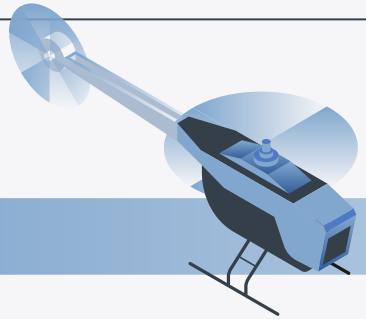
LASVIEW GITHUB

LiDAR Viewer

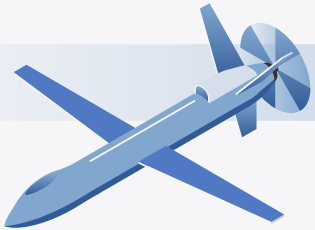
Implementation



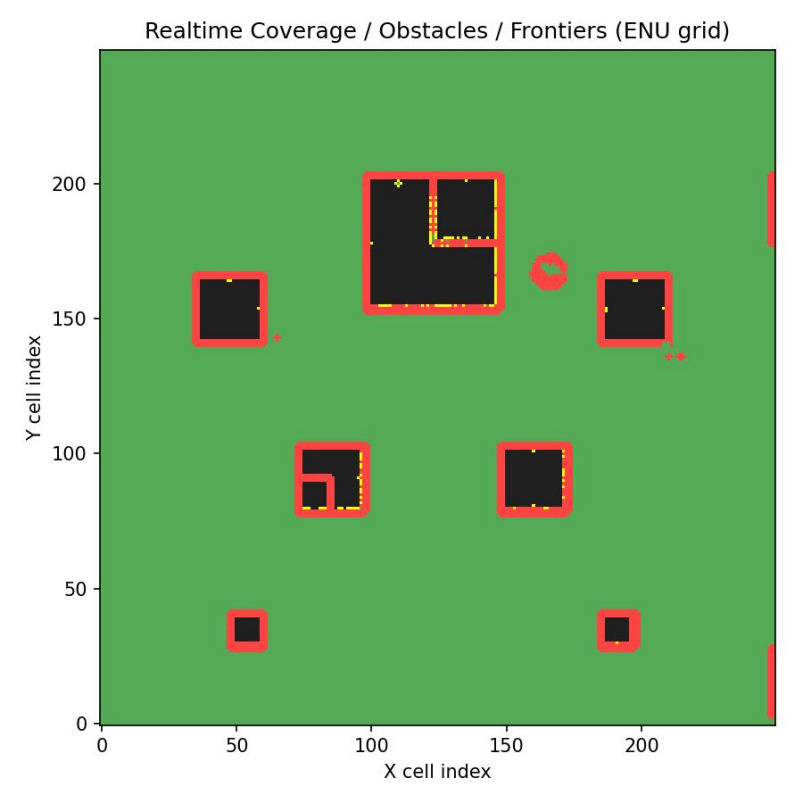
1. Initialize Multiple Drones & movement with NED (North East Down)
2. Align Drones with GPS & Collect LiDAR data with ENU (East North Up)
3. Use LiDAR data map to out obstacles and determine frontiers
4. Route the drones through safe cells frontiers to expand LiDAR coverage
5. Visualize LiDAR data with LASView

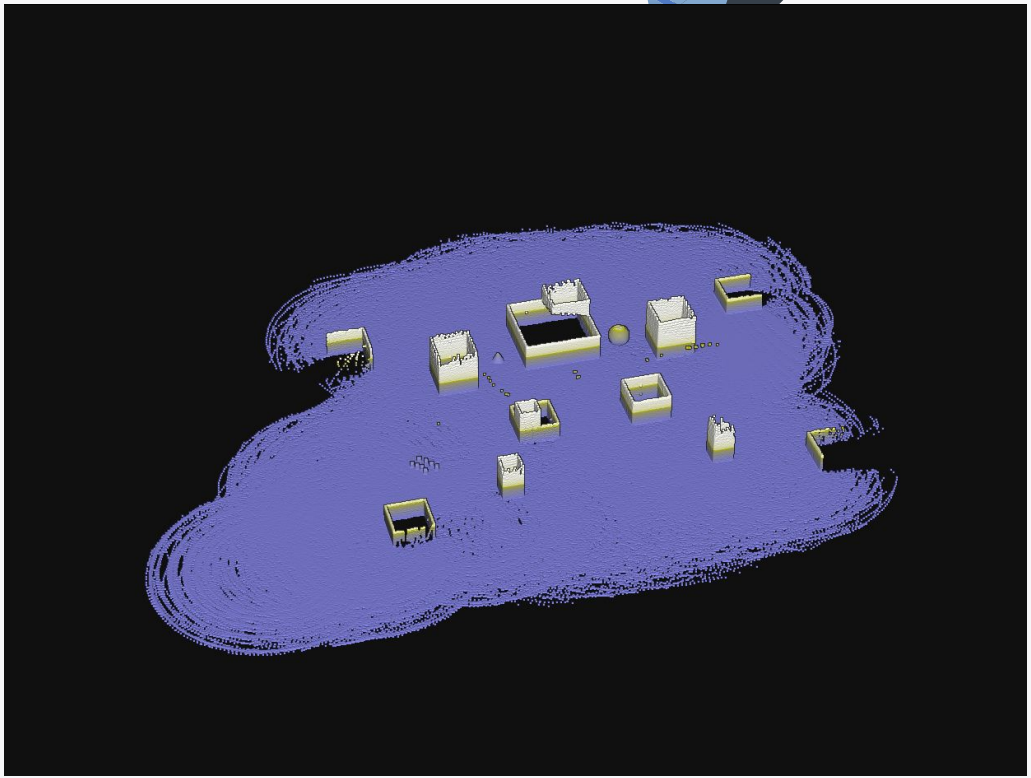


DEMO

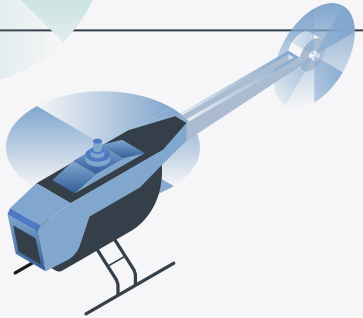


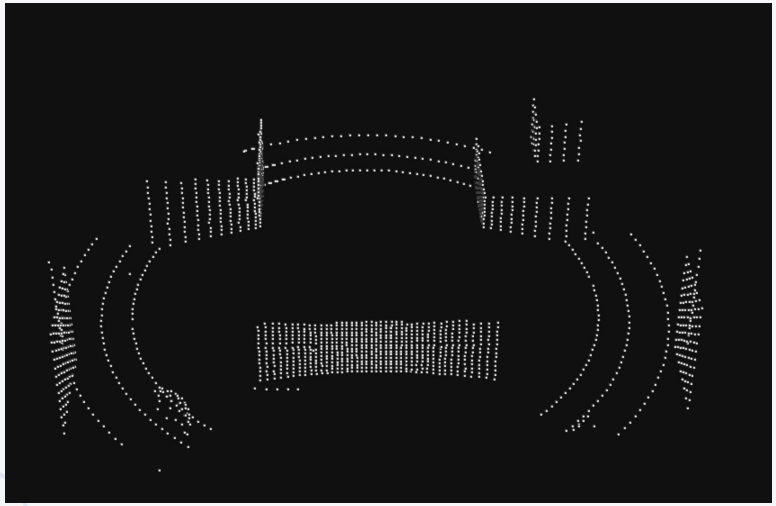
Final Results

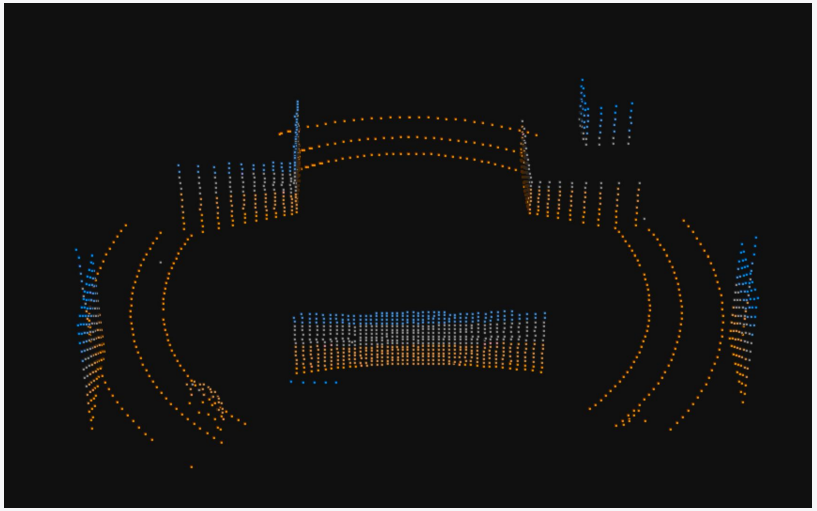




Single LiDAR Scan



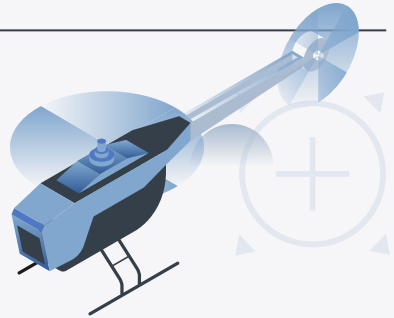




05

Evaluations

Evaluations



Challenges with Multiple Drones

- Recalculate positions of LiDAR points
- Better coordination needed for quicker area coverage
- Reduce amount of lidar data (Reduce Overhead)

THANKS!

DO YOU HAVE ANY QUESTIONS?