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From: BTT

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Summary

- 5 minutes presentation on Jan 9.
- Regular project meeting on every week.
- Organized all research, paper and information on Notion.
- Compared among all commercial UAVs to choose the UAV for project.
- Researched the paper related with image detection, UAV wireless network and multi-hop network.
- Researched Tello RoboMaster SDK.

What BTT completed this week:

- Project:
 - Made a brief presentation on Jan 9, that contain the project information and work plan.
Project: UAV interface development for countering danger or terroristic drones.
 - Made the Notion guide for Purdue students and organized the Notion pages to promote the project.
- Networking
 - Researched the network of UAV commonly used [1].
 - Researched How can the UAV share the important data fast, efficiently and reliably [2].
 - Compared among the UAV models of all brands.
 - Researched Multi-hop network for the U2U(UAV to UAV) communication [5].
 - Determined the wireless network protocol for short-range and long-range [5], [6].
 - Studied Tello RoboMaster SDK for the U2I(UAV to Infrastructure) communication by UAV WiFi direct mode.
- Detection
 - Researched object detection trends related to UAV [7], [8]. Took insight about UAV detection methodology.
 - Figured out categorized characteristics of UAV detection device from the investigated papers.
 - Researched UAV detection methods.
 - Collected image datasets and video datasets for UAV detection.

Things to do by next week

- Project:
 - Draft the introduction section and methodology section of paper.
 - Project meeting to organize the research and prepare the meeting with Dr. Matson.
 - Discuss the project blueprint and the solution of project issue with Dr. Matson.
- Networking:
 - Investigate the routing algorithm for multi-hop network.
 - Implement the code for video streaming on UAV.
 - Request the order of UAV, networking module and sensor.
- Detection:
 - Determine the detection method and sensors.
 - Design detection method.
 - Figure out efficient solution to detect small and too big UAV.

Problems or challenges:

- Networking:
 - Choose which UAV model will we use

The conditions are compatibility with DJI SDK and the development kit and reasonable price. On the other hand, Any DJI UAV model cannot satisfy both conditions. Even though some old models need Manifold that is additional computing hardware, Manifold is no longer in production.

Tello RoboMaster UAV that can satisfy the condition is also recommended. On the other hand, its sensor is inaccuracy. Researching the UAV model is necessary more.
 - Which routing algorithm will we use to implement Multi-hop network.
 - Which structure of UAV swarm will we set for experiment.
- Detection:
 - Preparing dataset problem that labeling each frame of video needs big time cost.
 - How to deal with low-quality image dataset for detection.

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