

## Senior Design Project Description for SPRING 2017

### Project Title: Investigation of Drone Applications: Vegetation Management and On-Campus Mail Delivery (UNCC\_DRONE)

Supporter: UNC Charlotte

Supporter Technical Representative: ASSIGNED

Faculty Mentor:  ASSIGNED  TBD (check one)

Single Team  Dual Team  (check one)

Personnel (EN/ET):  E,  Cp,  Cv,  M,  5 SE

(Complete if the number of students required is known)

Expected person-hours: (250 per student)

#### Description of Project:

Drones have the potential to be used to improve system performances in a variety of applications. In this project, students will investigate a possible use of drones in two areas:

1. Power Line Inspection for Vegetation Management
2. Inter-Departmental Mail Delivery System in the UNC Charlotte Campus

By nature, power transmission through overhead power lines is often disrupted by trees and other vegetation. To keep a reliable delivery of electricity to consumers, power lines need to be monitored and inspected. Drones can be beneficially utilized in a cost-, time-, and safety-effective way to inspect power lines.

#### Initial Project Requirements (e.g. weight, size, etc.):

During the first semester of the project, the project team will review the current inspection process, investigate Systems Engineering approaches to identify the objective function/constraints, develop an optimal inspection process using camera-equipped drones, and demonstrate the efficacy of the process through a controlled experiment.

During the second semester of the senior design project, the team will develop an inter-departmental mail delivery system using drones. For this task to be successful, the team will need to identify the range of mails that can be handled by the drone system, find an optimal path for delivery, and demonstrate the method via a controlled experiment.

#### Expected Deliverables/Results:

The deliverables will include:

1. Two end-of- semester reports that include a review of existing studies/practices, proposed methods, intellectual merits of the methods, and potential risk factors that may prevent successful implementations of the methods.



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2. Computer codes/programs that are necessary to implement the methods.
3. Demonstration of the methods to SEEM faculty member(s) and student(s).

**List here any specific skills or knowledge needed or suggested (If none please state none):**

None