Key Points

Project Number:
17STLSU11

Start Date:
05/08/2017

End Date:
11/08/2018

Principal Investigator(s):
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Lead Institution:
University of Louisiana at Lafayette

Funds Requested to UTC:
$47,000

Funding Source(s):
Tran-SET
University of Louisiana at Lafayette
Louisiana Transportation Research Center (LTRC)

Total Project Cost:
$94,000

Bridge Inspecting with Unmanned Aerial Vehicles R&D

Brief Project Description

This study will involve surveys, data gathering, and analysis to provide recommendations for two instrumented Unmanned Aerial Vehicle Systems (UAVs) for demonstration to determine their application, feasibility, suitability, practicality, and effectiveness according to a defined rubric centered around routine bridge inspection activities.

Objective

The purpose of this project is to determine the applicability of drone and Unmanned Aerial Vehicles (UAVs) technology for routine bridge inspection.

Intended Implementation of Research

Technology Transfer

The project will incorporate a T2 Technology Transfer Plan to help guide the development and potential adoption of the final product of the Team's research. The plan will seek to transfer technology to small business in the Lafayette, Louisiana area, and throughout Louisiana, particularly when those businesses have the potential to work with LADOTD or with civil engineering firms, in the inspection of bridges using Instrumented Unmanned Aerial Vehicles.

Workforce Development, Education, and Outreach

The project will utilize the informational and educational fruits of the technical research phase for Workforce Development, Outreach Activities, and Education. Workforce development will include disseminating the results through conferences, meetings, workshops, the project website, and webinars to educate and train professionals in the transportation industry, educating students and practicing engineers. Specifically, the following activities will be carried out in the project's implementation phase:

Workforce development:

- The PI and student team will plan to participate in conferences and will set up meetings, workshops, and webinars for professionals in the transportation industry. The University of Louisiana at Lafayette has a

Continuing Education Center that the project can leverage so as to disseminate the information learned to transportation industry professionals.

- Further, the information realized through the project will be incorporated into CAPSTONE Design classes through case studies to disseminate information to students.
- PI and student team will offer to provide seminars and tutorials to educate LADOTD engineers on the opportunities to improve bridge inspection through the use of UAVs equipped with instrumentation.

Outreach activities:

- The PI's Department of Electrical and Computer Engineering at the UL Lafayette already has an outreach network with high schools through its CAPE CubeSat Program. This network will be leveraged so as to engage high school students in the project effort, and to recruit underrepresented groups from high school students in the area. Outreach visits to local high schools and magnet high schools in Louisiana will be scheduled in order to promote engagement and recruitment of students.
- Seminars will be held -- Research results will be shared with all partner universities, e.g. LSU, UNO, Southern University, etc. and with community colleges such as South Louisiana Community College, in Lafayette, LA with general information provided via website and more detailed information provided upon request via CD or Dropbox™ Share.

Education:

- Tutorials addressing the advantages, disadvantages, and limitations of the use of drones and UAVs for routine bridge inspection, will be made available on the Research Team's Website.
- Knowledge obtained through the team's research will be offered to other universities in the Tran-SET university consortium for course inclusion.

Anticipated Impacts/Benefits of Implementation

The Research/Technical phase will finish with a report on the findings of the demonstration project, identifying the advantages, disadvantages, and limitations of the use of UAVs in routine bridge inspection work in Louisiana.

Weblinks:

http://transet.lsu.edu/research/research-in-progress/

https://rip.trb.org/view/1466913