

Quarterly Progress Report:

Project Number and Title: 1.12, Improved UAV-Based Structural Inspection Techniques and Technologies for Northeast Bridges

Research Area:

PI: Eric Landis, University of Maine

Co-PI(s): Alex Friess, Ali Shirazi, University of Maine

Reporting Period: 10/1/20 – 12/31/20

Submission Date: 12/31/20

Overview: (Please answer each question individually)

- Project commenced, project team established, including a Mechanical Engineering capstone design team.
- Conducted preliminary literature review of current state-of-practice of drone utilization for bridge inspections among state DOTs. Outline distributed to technical champion, industry collaborators.
- Team of student engineers completed design of prototype hexacopter drone capable carrying synthetic aperture radar module for under-bridge inspections, contact with structure.

Table 1: Task Progress			
Task Number	Start Date	End Date	% Complete
Task 1: Review of Current Regional Practice	10/1/20	12/31/20 / 2/15/21 (see below)	70%
Task 2: Survey of Commercially Available UAVs appropriate for Applications	10/1/20	12/31/20 / 3/31/21 (see below)	30%
Task 3: Prototype Development	10/1/20	5/31/21	40%
Task 4: Image array packages	1/1/21	9/30/22	0%
Task 5: Adv. Data interp.	1/1/21	9/30/22	0%
Task 6: Laboratory trials	3/1/21	9/30/22	0%
Task 7: Field trials	6/1/21	9/30/22	0%
Task 8: Field validation	TBD	TBD	0%
Overall Project:	10/1/20	9/30/22 (phase I)	
		9/30/23 (phase II)	

Table 2: Budget Progress		
Project Budget	Spend – Project to Date	% Project to Date*
\$566,743	(Vu?)	

*Include the date the budget is current to.

Describe any opportunities for training/professional development that have been provided

A large student team has been assembled, including two PhD students (one supported by project), and a Mechanical Engineering senior capstone design team, who is developing custom drone designs for bridge inspections.

Describe any activities involving the dissemination of research results

[None yet to report]

Table 3: Presentations at Conferences, Workshops, Seminars, and Other Events				
Title	Event	Type	Location	Date(s)

Table 4: Publications and Submitted Papers and Reports				
Type	Title	Citation	Date	Status

Encouraged to add figures that may be useful (especially for the website)...

Insert figures here

Participants and Collaborators:

Use the table below to list all individuals who have worked on the project.

Table 5: Active Principal Investigators, faculty, administrators, and Management Team Members			
Individual Name	Email Address	Department	Role in Research
Eric Landis	landis@maine.edu	CIE	PI
Alex Friess	Wilhelm.friess@maine.edu	MEE	Co-PI, Capstone Design Leader

Use the table below to list all students who have participated in the project during the reporting. (This includes all paid, unpaid, intern, independent study, or any other student that participated in this project.)

Table 6: Student Participants during the reporting period				
Student Name	Email Address	Class	Major	Role in research
Zahra Ameli		PhD	Civil Eng.	Grad. Research Asst.
Drew Bennett		Sr	Mech Eng.	Capstone Design Team
Dominic Dangelo		Sr	Mech Eng.	Capstone Design Team
Nathan Godbout		Sr	Mech Eng.	Capstone Design Team
Jack Leopold		Sr	Mech Eng.	Capstone Design Team
Nicolas Michaud		Sr	Mech Eng.	Capstone Design Team
Peter Rohrbacher		Sr	Mech Eng.	Capstone Design Team

Use the table below to list any students who worked on this project and graduated during this reporting period.

Table 7: Student Graduates			
Student Name	Role in Research	Degree	Graduation Date

Use the table below to list organizations have been involved as partners on this project and their contribution to the project.

Table 8: Research Project Collaborators during the reporting period						
Organization	Location	Contribution to the Project				
		Financial Support	In-Kind Support	Facilities	Collaborative Research	Personnel Exchanges
VHB	Augusta, ME (and others)				x	

List all other outputs, outcomes, and impacts here (i.e. patent applications, technologies, techniques, licenses issued, and/or website addresses used to disseminate research findings). Please be sure to provide detailed information about each item as with the tables above.

Have other collaborators or contacts been involved? If so, who and how? (This would include collaborations with others within the lead or partner universities; especially interdepartmental or interdisciplinary collaborations.)

Table 9: Other Collaborators			
Collaborator Name and Title	Contact Information	Organization and Department	Contribution to Research
Dale Peabody, Director, Research & Innovation	dale.peabody@maine.gov	Maine DOT	Technical champion

Who is the Technical Champion for this project?

Name: Dale Peabody
 Title: Director, Research & Innovation
 Organization: Maine Department of Transportation
 Location (City & State): Augusta, ME
 Email Address: dale.peabody@maine.gov

Changes:

COVID-related visa issues prevented PhD student to start at the project start date. The student was able to start 12/1/20, but this set back some of the initial tasks. We do not anticipate the delays propagating through the project.

Planned Activities:

We plan to complete Tasks 1 and 2, continue with Task 3, and commence with Tasks 4 & 5.