

Idaho Incubation Fund Program

Progress Report Form

Proposal No. IF18-006
Name: Sin Ming Loo, PhD
Name of Institution: Boise State University
Project Title: Infrasound Detector for Localizing Gun Shot
Reporting Period: Sept – Dec 2017

Information to be reported in your progress report is as follows (attach additional information as needed):

1. Summary of project accomplishments for the period just completed and plans for the coming reporting period:
 - Deployed detection array in Little Cottonwood Canyon near Salt Lake City, Utah, along highway that accesses Snowbird and Alta ski resorts as part of an avalanche detection study. This deployment is part of Utah DOT study looking for ways to upgrade and expand the present avalanche detection systems being used.
 - Redesigned microphone sensor enclosure to improve environmental stability and reduce wind noise level.
 - Developed a control board enclosure for ease of system deployment and data collection.
 - Designed a battery + photovoltaic power system to ensure continuous operation for the winter months.
 - Built a second system for deployment and testing here at Boise State University.
 - The array will be mounted on the roof of the Micron Engineering Center building to collect data on infrasound sensitivity and internal sensor noise levels.
 - Planned worked
 - Based on environmental data, develop filters and algorithms to ensure infrasound detection between 0.5Hz and 20Hz.
 - Calculate and program threshold limits for avalanche and gunshot detection into present firmware based on ongoing environmental testing.
 - Upgrade present control board with WiFi and Bluetooth connectivity for real-time remote data collection and expand file system memory capability.
 - Investigate the use noise cancelling to eliminate noise outside of the desired infrasound range.

2. Summary of budget expenditures for the period just completed (include project burn rate):
 - Original Budget: \$74,600
 - Expenses from September 2017 to December 2017: \$7,392
 - Note: The burn rate is slower than planned as we started in September 2017. One more student has been hired to work on this project. He will start January 2018.

3. Numbers of faculty and student participation resulting from the funding, including internships:
 - Primary Investigator Prof. S. M. Loo
 - Graduate/Undergraduate Study Employees: Mark Laverty, Austin Davis, Grady Anderson

4. List patents, copyrights, plant variety protection certificates received or pending:
 - None at this writing

5. List technology licenses signed and start-up businesses created:
 - None at this writing

6. Status of private/industry partnerships (include enough information to judge level of engagement):
 - The project will continue to work with WMDTech; a local business that provides training and implementation of explosive device detection and neutralization.
 - WMDTech along with their Utah Law Enforcement contact have suggested the gunshot detection array could be used by fish and game to detect and mitigate poaching.

7. Any other pertinent information that will indicate to the council that the project is meeting satisfactory progress.
 - A second prototype is being setup on the Micron Engineering Center's roof for system debugging and long-term reliability testing
 - WMDTech have been contacted and agreed to do gunshots testing.