PROJECT IDEA SUBMISSION – *RESEARCH*

LABORATORY INFORMATION

Name: ___Euiwon Bae_____ Date: _9/5/2024___

LABORATORY'S LIAISON CONTACT INFORMATION

Name: ___Euiwon Bae_____

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_____ _____ _____
City — State — ZIP Code

PROJECT NAME

SICK Lidar challenge – 10k

GENERAL PROJECT DESCRIPTION

SICK is excited to announce a challenge for universities across the US and Canada to support innovation and student achievement in automation and technology. Fifteen teams will be selected to participate in the challenge, and the chosen teams will be supplied a 16-layer, 360° SICK LiDAR sensor (multiScan) and accessories. The teams will be challenged to solve a problem, create a solution and bring a new application that utilizes the SICK scanner in any industry.

WHAT IS THE MECHANICAL ENGINEERING PROBLEM (APPARATUS) YOU ARE WANTING SOLVED (BUILT)?

Students will work with Prof. Bae to design, analyze, build and test a unique platform utilizing a Lidar sensor (which will be provided by SICK if your team's proposal is selected)

WHY IS THIS PROBLEM (APPARATUS) WORTH SOLVING (BUILDING)? (Value Proposition)

Lidar sensors have many benefits, including:

Accuracy: Lidar sensors can provide accurate measurements, even in challenging environmental conditions.

Speed: Lidar sensors can quickly collect data, such as acquiring 1,000 square kilometers in 12 hours.

Automation: Many processes associated with lidar are automatic, unlike other methods like photogrammetry, GPS, or land surveying.

Weather and light independence: Lidar sensors can collect data at night and in slightly bad weather, and are not dependent on sun inclination.

Integration with other data sources: Lidar sensors can be integrated with other data sources.

This competition is seeking an novel application of how to use a LIDAR sensor in new areas.

WHAT ARE THE MOST IMPORTANT FUNCTIONAL REQUIREMENTS AND SPECIFICATIONS FOR THIS PROJECT?

Req 1: Must use the LiDAR Sensor provided by the company

Req 2: Other rules can be found here https://www.sick.com/us/en/sick-10k-challenge/w/10K-Challenge/

Req 3:

WHAT DO YOU ANTICIPATE THE STUDENTS DESIGNING, ANALYZING, BUILDING/PROTOTYPING AND TESTING? BE AS SPECIFIC AS POSSIBLE.

Design: Design a platform based on the targe applications and potential customers and business opportunity

Analyze:Platform should include the use of LIDAR sensor for certain purpose and data analysis, circuitry interface, etc will be required for analysis

Build: Working prototype realizing the proposed idea

Test: Test data, video, graphs, and photos

WHAT IS YOU BEST ESTIMATE OF THE COST OF THE HARDWARE, COMPONENTS, MATERIALS, … OF THE PROPOSED PROTOTYPE?

Total under $1000 (LIDAR will be provided by the SICK for free if your idea is selected)

Hardware Costs:

Component Costs:

Material Costs:

…

HOW MUCH TIME AND EFFORT WOULD YOU EXPECT TO SPEND ON THIS PROJECT IF YOU WERE DOING IT INTERNALLY?

Oct 2024- March 2025

This is a different schedule than your ME463 Spring 2025. If you are interested in this opportunity, all team member should acknowledge that they can start contributing their time and effort starting Oct 2024 and project should end by mid-March 2025 (which is about 1.5 month earlier than the regular ME463 projects). This schedule is set by the sponsor so Prof. Bae will work with the team to adjust the schedule while still accomplishing the same curricular activities required to satisfy the ME463 course objective.

DO YOU BELIEVE THE PROJECT CAN BE COMPLETED WITH EXISTING TECHNOLOGY, IF NOT, ELABORATE ON NEEDED DEVELOPMENTS?

Yes,

CONCERNS OR OTHER RELATED INFORMATION ASSOCIATED TO THE PROPOSED PROJECT?

Concerns: Schedule difference; should be able to work during Fall 2024

Other Info: 15 teams will be selected and there will be cash prices of 10k/5k/3k for the top three teams after March 2025 final presentations.

ATTACH ANY APPROPRIATE SKETCHES, DRAWINGS, STANDARDS, DATA, PHOTOS, … USEFUL IN JUDGING APPROPRIATENESS AND SCOPE OF PROPOSED PROJECT.

(list of attachments)

ARE YOU WORKING WITH ME SENIORS WHO YOU WOULD LIKE ON THIS PROPOSED PROJECT? YES/NO (If YES, provided what information you can.)

NAME	PUID	PHONE	EMAIL

Save this filled out .docx with the following naming nomenclature: "RESEARCH_*project name* – *student point of contact full name*.docx" where the *italic strings* get replaced with appropriate actual text strings.

If you have any questions concerning a proposed project or completing this form please contact Professor Greg Jensen.

To submit this document for consideration, please complete the survey using either the QR code or the link below.

https://purdue.ca1.qualtrics.com/jfe/form/SV_bkCjo7jyE5Wb7ro

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