Senior Capstone Project Proposal

The project is designed for a team of students working toward completion of a project, within two semesters[1].

Title	Implementation of a vibration condition-based monitoring on a strander
Sponsor	Contact person: Bastien Carel Company name: Fort Wayne Metals
	Contact info: Bastien_Carel@fwmetals.com 260-918-3771
Description	Fort Wayne Metals uses wire stranders to manufacture cables and strands. The machines operate at speed up to 2,000 RPM which require low system vibration. The stranders are initially tested manually to get a baseline vibration profile for future diagnostics but are not checked on a recurring basis. Early detection of vibration deviation could be vital in preventing potential critical bearing housing failure. The bearing housing replacement can extend into several thousands of dollars with multi-week lead times. IIoT has changed the way condition-based monitoring can be completed. Sensors installed on the asset can perform real-time vibration analysis and monitor change - Wireless Vibration Sensor - Wireless Sensors – ERBESSD INSTRUMENTS (erbessd-instruments.com). This can greatly reduce the need for manual inspections and testing. Sensors will monitor the asset condition for indicators of decreasing performance or imminent failure, publish data to the IIOT platform, and notify the maintenance team of the change in asset condition. The project includes design, installation, troubleshoot, integrate, and visual notification aspects of the monitoring process.
Disciplines (ME, EE, CS, etc.)	Lincoln, Cody A. (CPE); Anderson, Jonathan D. (EE); Anderson, Nicholas J. (EE)
Estimated budget	$2500 for sensors, gateway and related hardware
Technology Disclosed? If so, what?	Stranding technology

[1]In general, one semester has 15 weeks. For a 3 credit hours course, a student is expected to work minimum of 8 hours per week for the project which is equivalent to minimum of 120 hours.

Additional requirements	
NDA or IP Assignment agreement requested?	NDA
Faculty Advisor	Dr. Guoping Wang
Notes	US citizenship required.

Technology and ECCN:
"If your project involves 'technology' that is either (a) not publicly available or (b) includes proprietary source code (not executable files), then it requires an ECCN." 'Technology,' for this purpose, is defined as "information necessary for the development, production, use, operation, installation, maintenance, repair, overhaul or refurbishing of an item. Technology may be in any tangible form, such as written or oral communications, blueprints, drawings, photographs, plans, diagrams, models, formulae, tables, engineering designs and specifications, computer-aided design files, manuals or documentation, electronic media or information revealed through visual inspection."

Interactive tool to determine ECCN:
https://www.bis.doc.gov/index.php/export-control-classification-interactive-tool

NDAs and IP Assignments:
The sponsoring company typically has NDAs and IP assignment forms that it wishes to use. Neither the NDA nor the IP assignment is an agreement with Purdue directly; these agreements are between the students and the sponsoring company. Of course, our office can review the company-provided documents to be certain it aligns with Purdue's standards. Alternatively, our office has draft agreements which we could provide for the sponsor's use. Again, as NDAs are between the student and the sponsor, Purdue cannot be a party to or advise the sponsor or the student on the NDAs, other than to outline some basic expectations as to fairness and suitability of the NDA to a student project.

Sponsor Acknowledgements:
By way of background, Purdue University professors who have senior capstone class projects involving outside sponsor companies notify our office so that we can prepare an acknowledgement form for the sponsoring company's completion. This is not a contract but an acknowledgement form signed by sponsoring companies which lays out Purdue's guidelines regarding class projects and outside company inputs, potential export control issues, and student intellectual property. Some sponsoring companies offer a monetary donation to the project, but that is not a requirement.

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