Short Description of VIP Team Options for LC Students – Fall 2021

Students will complete the VIP Team Preference survey in Qualtrics:
https://purdue.ca1.qualtrics.com/jfe/form/SV_0NC7TCdoix6Li62

Milestones: Milestones teams allow first-year students to gain skills and knowledge within the context of three different areas: 1) automotive; 2) autonomous systems; and 3) grand challenges. After completing a semester of Milestones, students will be prepared to effectively contribute to VIP teams that align with their interests and goals. https://engineering.purdue.edu/VIP/teams/milestones

Laser-Assisted Processing - This team is to perform research work in the laser-based manufacturing and materials processing area, such as additive manufacturing involving ceramics and/or other topic(s). https://engineering.purdue.edu/VIP/teams/lap

Autonomous Motorsports Purdue (AMP) - Autonomous racing project including both software and hardware aspects, with emphasis on path planning, sensor fusion, and machine learning techniques. https://engineering.purdue.edu/VIP/teams/amp

Earth History Visualization: This team has been very successful during the past years in making our planet's history easily accessible to both public and scientific audiences. Our current goals are (1) user-friendly web-applications for Earth-history visualization, (2) applying data-mining and machine-learning techniques to the vast databases to unravel our planet's secrets, and (3) be an active part of the new "Deep-Time Digital Earth" big-data science program of the Intl. Union Geol. Sciences/UNESCO. https://engineering.purdue.edu/VIP/teams/ehv

Earth Remote Sensing with Signals of Opportunity: Design instrumentation and conduct field experiments to collect VVHF/P-band and S-band satellite signals and evaluate their qualities for use in Earth remote sensing. https://engineering.purdue.edu/VIP/teams/ers

SafeRegex – This team will develop tools and mine user interactions and software repositories to benefit thousands of practicing engineers. https://engineering.purdue.edu/VIP/teams/saferegex

Research and Development in IoT and Edge Processing - The Bechtel Innovation Design Center on Purdue's campus is a student project facility which serves students across the whole of Purdue. To keep our students safe, and to understand the use of the center, develop and deploy an ever-evolving network of off-the-shelf and full custom IoT platforms employing machine learning and edge processing to monitor usage, verify and enforce safety and gather analytic data. https://engineering.purdue.edu/VIP/teams/iot

SoCET – System on Chip Extension Technologies: The primary objective of the SoCET team is to provide students with a comprehensive System on Chip design, fabrication and test experience that is as similar to industry practice as possible. https://engineering.purdue.edu/VIP/teams/socet

Computer Vision for Forest Inventory Analysis - Forest inventory is the process of evaluating a forest's condition. This team is creating an algorithm to process stereo video footage from cameras equipped with motion sensors to acquire and analyze individual tree data as well as construct 3D reconstructions. The team's goal is to create a low-cost, accurate system to obtain rich, individual tree information below the canopy. https://engineering.purdue.edu/VIP/teams/fia

Video Analytics for Understanding Human Behavior - This study aims to use video along with environmental sensors to develop a behavioral model that can be used to predict human action during design and before construction and to analyze pre- and post-COVID use patterns within the built environment. https://engineering.purdue.edu/VIP/teams/vauhb

Image Processing and Analysis: This team uses machine learning strategies for image recognition and video processing research applications. https://engineering.purdue.edu/VIP/teams/ipa

Tracsat: This team will build and test various subsystems of nanosatellite and laser communications system. https://engineering.purdue.edu/VIP/teams/tracsat

Air Force Research Laboratory - Unmanned Aerial System (AFRL-UAS): Hands-on Unmanned Aerial Systems research at Purdue's world class indoor motion capture environment, Hangar 4. Direct collaboration and support from AFRL (Air Force Research Labs) Aerospace Systems Directorate. https://engineering.purdue.edu/VIP/teams/afrluas

TensorFlow Model Garden - This team's goal is to create a standard for worldwide machine learning model development. We are creating high-quality implementations of state-of-the-art machine learning models. https://engineering.purdue.edu/VIP/teams/tensorflow

Video Analytics for Understanding Animal Behavior - This team will build systems that extract information about animal behavior from images and videos obtained of animals situated in their natural environment. https://engineering.purdue.edu/VIP/teams/vaa

Race to Zero (R2Z) - The goal of this VIP Global "Race to Zero" program seeks to integrate hydrogen fuel cell technologies into the design of a net-zero energy building and is inspired by the United Nations Climate Change "Race to Zero" campaign. https://engineering.purdue.edu/VIP/teams/r2z

Robotic Exploration - The team will design, build and test a set of land and water-based robots to monitor the physico-chemical conditions of watersheds.
https://engineering.purdue.edu/VIP/teams/rexp

Lunabotics - The team will design, build, test and prepare an autonomous robot for a lunar mining competition sponsored by NASA. https://engineering.purdue.edu/VIP/teams/lbot

SWARMS: Multi-Agent Control Simulation Platform: Creating a customizable drone swarm control and simulation platform utilizing the cloud. https://engineering.purdue.edu/VIP/teams/swarms

Image Based Mobile Phone Applications - The students will develop mobile phone applications that capture images of the scene and extract information from them using tools such as machine learning. https://engineering.purdue.edu/VIP/teams/imp

3D Imaging and Image Analysis - The objective of this research team is to develop the next generation 3D sensors that could be deployed to conquer challenges facing in the state-of-the-art sensors, or use

the existing 3D sensors more intelligently through better 3D data analysis algorithms. The application areas could be autonomous vehicles, forensic sciences, and robotics. https://engineering.purdue.edu/VIP/teams/3Dia

Boiler-up Farm System - This project addresses food insecurity for communities across Purdue. The team will design, develop, and test the prototype of the farm system researching materials, mechanical, electrical, and agriculture sub-systems. An additional goal is to study producibility and productivity along with reliability, reproducibility, and safety. https://engineering.purdue.edu/VIP/teams/boilerup-farm-system

LyoHUB - The LyoHUB lab in Purdue University's Birck Nanotechnology Center will host a team to work on cutting edge sensor technology for the pharmaceutical industry. Team members will gain valuable hands-on experience in circuit design, sensor fabrication, wireless networking, and data analysis. This team will work with superusers in LyoHUB demonstration facility, and will present to LyoHUB industry members which include large pharmaceutical companies, equipment manufacturers, software developers and more. https://engineering.purdue.edu/VIP/teams/LyoHUB

Project Rekor - Software Supply Chain Transparency: this team will work with industry and open source partners to build software infrastructure to cryptographically verify provenance of software. https://engineering.purdue.edu/VIP/teams/rekor

Solar Sail - Solar sail is a technology to propel spacecrafts using the optical pressure from the sun. Two video cameras will monitor the shape of the sail to estimate the optical pressure and the acceleration. First-year students have conducted trade studies to help inform what type of camera system should be used in future NASA Solar Cruiser missions. https://engineering.purdue.edu/VIP/teams/sail