



CENTER FOR INTELLIGENT INDUSTRIAL ROBOTICS

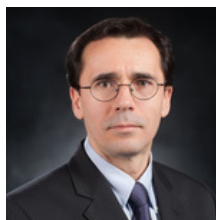
CENTER SUMMARY

The need for manufacturing automation engineers and programmers is growing at a rapid rate. The Center for Intelligent Industrial Robotics (CI²R) will serve as an entity to foster faculty and student collaboration between cross-disciplines, applied to a host of applications from manufacturing to agriculture. The Center is providing a focus for attracting research grants and other external funding to build the University of Idaho Vandal Robotics program. The University of Idaho Computer Science, Mechanical Engineering and Electrical Engineering programs are building a 21st century program with equal attention to new software paradigms such as AI (including machine learning) and PLC programming in conjunction with industrial automation and robotics. We currently have 8 robotic labs across all three main campuses, Coeur d'Alene, Moscow and Idaho Falls. There are no comparable robotics programs in the Western US. **We are unique.**

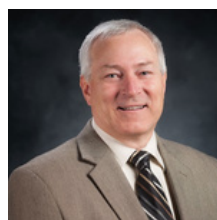
KEY CONTRIBUTORS



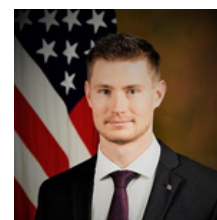
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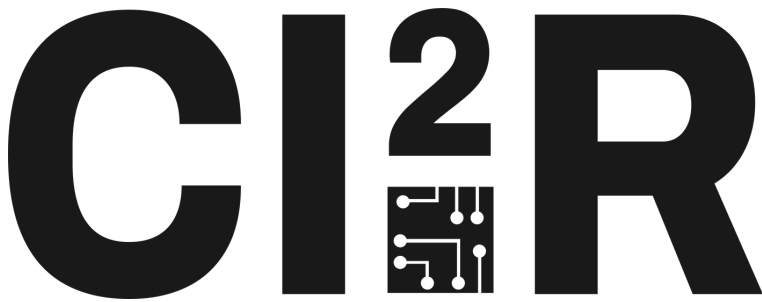
CENTER APPLICATION AREAS

- Manufacturing Automation** – Additive robotics - growing segment, necessary to compete
- Agricultural Automation** – Precision Agriculture, Automated processes (Vineyards)
- Food Processing** – CAFÉ, food processing and production
- Nuclear Industry** – Processing, remote manipulation, AR/VR
- Cybersecurity for Manufacturing Automation**

TEACHING IN ROBOTICS

- CS453/CS553** Robotics Systems Engineering I
- CS454/CS554** Robotics Systems Engineering II
- CS466/CS566** Programmable Logic Controllers for Manufacturing (Cross listed with ME)
- CS443/CS543** Embedded Systems
- CS455/CS555** Machine Vision
- CS452/CS552** Real Time Operating Systems

There is additionally a Graduate Robotics Certificate in Computer Science available, requiring 12 credits of 500-level classes.



CROSS- DISCIPLINARY APPLICATIONS

College of Natural Resources

- Forestry Harvesting Automation
- Ecological and Conservation Monitoring of environment and endangered species
- 3D Wood Printing

College of Agriculture and Life Sciences

- Food processing
- CAFÉ Food Science and Manufacturing (including food service industry)
- Precision Agriculture

Idaho Water Resources Research Institute

- Submersible Automated Collection of Lake Environmental Data

College of Engineering

- Automated Vineyard Management and Analysis (Project VineHeart) – talking with CALS for domain expertise
- Mechanical Engineering Industrial Robotics Program
- Cybersecurity for Industrial Robotics
- Chemical Engineering Process Automation
- Computer Science Industrial and Manufacturing Robotics Program
- Computer Science AI Program

College of Science

- Automation of Chemical Analysis and Processing
- Bioinformatics and Computational Biology

College of Letters, Arts and Social Science

- Department of Psychology – Robotic Kinematic Assessment Tool

OUTREACH

The need for robotic automation in manufacturing is growing substantially and the lower cost of robots is making it more accessible to smaller manufacturing companies that can benefit from adding incremental automation to their lines. As part of this center, we are working with Idaho TechHelp in developing an on site assessment tool and process for manufacturing companies to determine where automation can help in remaining competitive, worker safety and cost reduction. This will directly help smaller manufacturing companies in Idaho and Eastern Washington. As part of further outreach, we will be participating in industrial groups such as the Idaho Manufacturing Alliance and the I90 Aerospace Corridor Organization. Finally, we will be organizing an industrial advisory board for the center to bring in more manufacturing input.

MARKET DEMAND

The global supply of industrial robots has practically doubled from 159,000 in 2012 to 294,000 in 2016. It reached 422,000 robot installations in 2018 and is forecasted to grow on average by 12% per year from 2020 to 2022. Robots for professional and personal service are expected to grow at 40% per year. The global robotics market is set to reach USD 191 billion by 2026. With a growth rate 40%, Robotics Engineer ranks 2nd among LinkedIn's top-15 emerging jobs in the US. The University of Idaho is uniquely positioned to offer programs that fill these needs of industry and create better opportunities both for students and businesses in the area and across the country.

10/10/2022

