

Vision System for Plasma Transfer Arc Additive Manufacturing

PROJECT DESCRIPTION

"This internship will take place at the Additive Design and Manufacturing (ADAM) Laboratory at the University of Alberta. ADAM lab carries out research in the emerging area of additive manufacturing AM processes with a focus on design and manufacturing of AM systems. Currently the laboratory has a number of cutting edge research and development projects for different additive manufacturing processes for polymer, composite, and wear resistant metal materials. The research is focusing on development of systems, process and quality assurance, and design for additive manufacturing.

This project relates to an ongoing project on development of a realtime vision system for an experimental Additive Manufacturing machine. The main deliverable will be to adapt a camera system for image acquisition from a Plasma Transfer Arc. The system will acquire real-time images and process the images for a layer thickness controller. Mechanical setup for the camera is required. Testing the image acquisition to obtain real-time parameters for the controller will also be carried out along with algorithm generation for processing the images. The final aim of the project will be to develop and implement controller configuration to compensate layer thickness in the additive manufacturing process.

Required skills/background:

The ideal student would have the following attributes:

- Background in Mechatronics, electronics, or computer engineering. Other disciplines may be considered based on the relevance of the experience.
- Mechanical Assembly Skills.
- Conversational skills for quoting parts.
- Programming skills: python, C++, LabVIEW.
- Engineering Control Skills.
- Real-Time Systems.

Required Role:

The student will work closely with the supervisor and a graduate student for developing the system described. The student will be supervised and assigned tasks related to computer aided design and development for the vision system. The major tasks include the hardware development and the software development. The hardware development will comprise, design of in house components for the vision system and their integration with commercial off the shelf parts for system integration. The software aspect will comprise the design and

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programming of algorithms for data acquisition from the hardware and analysis of the acquired data for process optimisation. "

FACULTY-DEPARTMENT

Engineering - Mechanical

DESIRED FIELD OF (STUDENT) STUDY

Mechatronics, Electronics, or Computer Engineering

INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

NUMBER OF INTERNSHIP POSITIONS

2

INTERNSHIP START DATE

July 4, 2018

INTERNSHIP END DATE

3 months after start

ARE THE DATES FLEXIBLE?

Yes, I am flexible regarding the internship dates. Selected students can contact me to request a date change.