

Influence of Materials and Process Variables on Geometric and Mechanical Properties in Material Jetting Process

PROJECT DESCRIPTION

"Material jetting based additive manufacturing process enables production of complex 3D parts without tooling and minimum material wastage. Automated material jetting systems are being developed at the Additive Design and Manufacturing (ADaM) lab, Department of Mechanical Engineering, University of Alberta, Edmonton Canada. The goal of ADaM's lab is the development of additive manufacturing methods and technologies that constantly meet growing requirements in terms of cost, quality and time.

One focus of our research towards enhancing the quality of manufactured components is to investigate the influence of materials and process variables on both geometric and mechanical properties of components manufactured using material jetting process. Fundamental material combinations with polymers and permissible material jetting process parameters are yet to be realized and optimized for enhanced geometrical and mechanical properties.

Required Role:

Working with the supervisor, the student will primarily:

- Identify materials for geometric and mechanical property enhancements
- Identify fundamental process parameters that govern material jetting based additive manufacturing process
- Construct design of experiment framework to realize and optimize process parameters
- Conduct microscopy and mechanical tests to characterize manufactured specimens
- Validation for mechanical properties using theoretical models for multi-material combinations

Required Skills:

- Undergraduate student in engineering (Mechanical, materials, Industrial and production)
- First hand experience with optical microscopy, image processing, design of experiments and mechanical testing
- Knowledge of solid mechanics for theoretical validations is an asset
- Good knowledge of Solidworks, Matlab and statistical tools

Contact: Brendan Cavanagh, Internship Coordinator (Inbound)
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FACULTY-DEPARTMENT

Engineering - Mechanical

DESIRED FIELD OF (STUDENT) STUDY

Mechanical, Industrial, Mechatronics, Material Engineering

INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

NUMBER OF INTERNSHIP POSITIONS

1

INTERNSHIP START DATE

July 4

INTERNSHIP END DATE

3 months after start date

ARE THE DATES FLEXIBLE?

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