Geometric Optimization of 3D Printed Assemblies

PROJECT DESCRIPTION

Although Additive Manufacturing has become popular, there are many areas of improvements. The properties of the parts manufactured with additive manufacturing depend on a large number of machine and process variables. This leads to variations in the output geometry of the printed part, and makes it difficult to assemble. The objective of this project is to investigate the effect of parameters on geometrical properties of assembly models printed using DLP (Digital Light Processing) and FDM (Fused Deposition Modeling). Dedicated GD&T drawings will be made for the assembly test prices so that the geometrical output of the parts can be studied. An assembly test piece will be designed for this and a statistical analysis will be conducted to find significant variables and the output characteristics. These results will be further analysed to do predictive modeling of the output geometrical properties and a compensation tool will be developed to incorporate these variations into the initial stage of the printing to mitigate variations and to obtain accurate parts and assemblies. The fit and function analysis of the assemblies will also be done to ensure proper functionality of the mechanism. The data generated will be further used to do tolerance analysis on the assembly parts to calculate the process capability of the printer and to assign the limits for the tolerance values of that particular printer. Finally, a case study will be done to validate the above experimentation and modeling results. This will make the printer useful for further assembly printings with full form and function.

FACULTY-DEPARTMENT

Engineering - Mechanical

DESIRED FIELD OF (STUDENT) STUDY

Mechanical, Industrial, or Systems Engineering

INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

NUMBER OF INTERNSHIP POSITIONS

1

INTERNSHIP START DATE

January 2, 2018

Contact: Brendan Cavanagh, Internship Coordinator (Inbound)
University of Alberta International
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**INTERNSHIP END DATE**

12 weeks from start

**ARE THE DATES FLEXIBLE?**

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