

## Faculty of Engineering

### Summer Research Program 2022-2023

Project Title: Studying residue stress and material failure of AM printed parts via process simulation

Supervisor(s): Dr. Samuel Lim and A/Prof. Aijun Huang

Department: Materials Science and Engineering

Email: Samuel.lim@monash.edu

Website profile of project supervisor: <https://research.monash.edu/en/persons/samuel-lim>

---

#### Objective

Investigate the effect of selective laser manufacturing (SLM) printing parameters and process on residual stress as well as material integrity via process simulation.

#### Project Details

Selective laser manufacturing as an additive manufacturing is fast becoming a mature manufacturing process. However, there still aplenty of challenges and one of that is residual stress and part failure during or after printing. To overcome this challenge, process simulation can be a very useful tool. Yet the number of people knowing how to use it properly is limited. In this project, process simulation software would be used to simulate the SLM printing of cantilever like component to evaluate the printing parameters and process on the residual stress development in Ti alloy that is widely used for aerospace and biomedical application. The simulation results will be validated with actual printed parts.

#### Prerequisites

2<sup>nd</sup>/3<sup>rd</sup>-year materials science and engineering/mechanical engineering students. Person with experience or interest in using simulation tools is preferred.

#### Additional Information

applicants may email to find out more about the project.