Master Thesis Defend Examination

Presented by

Ms. Kawintra Khemabulkul

Advisor: Assoc. Prof. Dr.-Ing. Pruet Kowitwarangkul

Thesis Title: Effect of Scanning Pattern on Selective Laser Melting of Ti-6Al-4V

Highlight Summary

Selective Laser Melting (SLM) is a widely adopted additive manufacturing technique that fabricates intricate metal components layer by layer. The scanning strategy plays a crucial role in improving the final part quality, as different scanning strategies lead to variations in temperature distribution. These variations can have a considerable impact on both the behavior of the melt pool and the mechanical properties of the resulting parts. This study investigates the impact of uni-directional, bi-directional, and altered sequences of uni-directional and bi-directional scanning strategies, with overlap percentages of 30% and 10%, on localized temperature distribution, melt pool dynamics, and surface roughness (Ra) during the SLM process of Ti-6Al-4V. Numerical simulation was carried out using Flow-3D AM, incorporating the Discrete Element Method (DEM) and the Computational Fluid Dynamics (CFD) model. The findings demonstrate that scanning strategies significantly impact on localized temperature distribution, melt pool dynamics, and surface roughness. These results offer important insights into optimizing scanning strategies to enhance Ti-6Al-4V part quality and provide guidance for future research aimed at improving SLM performance.

Date	Time	Venue
26 November 2025	2:00-3:30 p.m.	Room No. 604-3, TGGS Building

Registration is open from today until 21 November 2025

QR Code for Registration