PhD Scholarship in Machine Learning Assisted 3D Printing for Space and Medical Devices

Metal additive manufacturing (AM) has evolved rapidly to become the cornerstone of digital/on-demand manufacturing, sustaining the worldwide pursuit of a circular economy in the last decade. However, AM has encountered a great challenge concerning how to certify /qualify the fabricated components with predictable properties including mechanical, biological properties, etc. To conquer this challenge, a high-throughput machine learning approach coupled with fundamental materials science theories is proposed for this PhD project to uncover the fundamental process-structure-property-performance relationships in AM. The successful implementation of this project will deliver immediate impact and tangible value across all sectors in AM field and will reshape the future of global manufacturing industry, in particular in the space and medical device sectors.

This project leverages the expertise of a multidisciplinary supervisory team from Engineering and Science Faculties at UNSW (Dr Xiaopeng Li, Prof Jay Kruzic and Prof Michael Ferry). The students will visit Stanford University (Stanford Visiting Student Researcher Program) to work with Profs. Wei Cai and Adrian Lew (1-2 years) to use Stanford's unique and world-class additive manufacturing and modelling techniques for the PhD project. In addition, this project also provides exciting opportunities to the PhD students to work with Australian space and medical devices companies as well as additive manufacturing companies.

The ideal candidate for this project will hold either a Bachelor's or Master's degree with a final weighted average grade of 80% in Materials Science & Engineering, Mechanical or Computer Science and Engineering or other related fields. We are seeking a candidate with intermediate (or above) research experience in academia or industry. The necessary experimental skills of the candidate, including alloy fabrication, advanced materials characterisation and mechanical testing, are highly desired but not required. Furthermore, the candidate must be an ambitious and resilient team-player with demonstrable leadership and skills and is willing to carry out collaborative short-term research at Stanford University and Australian companies during this project.

The Scholarship is valued at about $35,000 per year (tax-free), with $15,000 project funding per year to cover experiments, consumables, and travel. If you would like to know more about this project, please feel free to contact Dr Xiaopeng Li (xiaopeng.li@unsw.edu.au), Prof Jay Kruzic (j.kruzic@unsw.edu.au) or Prof Michael Ferry (m.ferry@unsw.edu.au).