Research project and supervisory team

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Short introduction & description of research project	Title: Low-Cost Titanium Additive Manufacturing for Bio-inspired Robots Research Areas: Additive Manufacturing, Bio-inspired Robotics, Lightweight Structures Project Description: This interdisciplinary PhD project bridges a novel hydrogen-embrittlement-based titanium powder (non-spherical, low-cost) with the design and fabrication of bio-inspired robots. While conventional titanium 3D printing relies on expensive spherical powders, our approach uses a fundamentally different route — systematically investigating how irregular particle morphologies affect melt pool dynamics, microstructure evolution, and mechanical performance. You will establish the process–structure–property relationships for this emerging class of powders. The ultimate goal is to apply this knowledge to manufacture key lightweight components for bio-inspired robots (e.g., monolithic joint housings, flexible spine segments). You will then integrate these additively manufactured parts into fully functional robots — platforms that already have commercial orders and are being spun off into a high-growth startup. You will receive training in both metal additive manufacturing (laser powder bed fusion, powder characterization, mechanical testing) and robotics (kinematics, soft actuators, ROS-based control). Our group maintains strong ties with industry and collaborates with world-class faculty in materials and mechanical engineering. We seek a highly motivated candidate with a background in mechanical engineering, materials science, robotics, or a related field. The project offers excellent opportunities for high-impact publications and a clear pathway from fundamental science to real-world deployment. Keywords: Additive Manufacturing, Titanium Alloy, Hydrogen-Embrittlement Powder, Snake Robot, Bio-inspired Robotics, Lightweight Structures
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