Master Semester Project: “Design of a gas flow system for a new Selective Laser Melting (SLM) prototype machine”

Selective Laser Melting (SLM) is a fast evolving Additive Manufacturing (AM) process used in industries such as aerospace, automotive, biomedical and energy. A layer of metallic powder is deposited on a substrate, and is selectively fused using a high-power laser and following a 2D slice of a 3D CAD object. This is repeated until completion of the part. One of the biggest advantages of the LPBF process is the ability to build parts with very complex geometries (lattice structures, conformal cooling channels, small features, etc). However, the SLM production process generates fumes that can obstruct the laser beam and are detrimental to the final quality of the part. It is therefore necessary to control the process environment and to design a protective gas flow within the build chamber, to ensure optimal print quality as well as repeatability of results.

This semester project aims to develop a gas flow system to control the environment within the build chamber and will assist researchers in the optimization of LMTM’s novel in-house SLM machine.

Both materials (IMX) and mechanical engineering (IGM-GE) students are encouraged to apply.

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