Chair of Materials Engineering of Additive Manufacturing
TUM School of Engineering and Design
Technical University of Munich

ΤΛΠ

Bachelor / Master Thesis or Semester Project

Strain field computation through digital analysis of microscope images

Background

The Chair of Materials Engineering of Additive Manufacturing features a nearly unique piece of equipment: With our confocal laser scanning microscope, equipped with a furnace and a tension/compression load stage, in-situ studies of the microstructure evolution at high temperatures and/or loads are possible.

Aim

In the scope of this thesis, a routine for the computation of strain fields from microscope images / videos should be developed. Eventually, the aim is a tool that allows for the analysis of material behavior on the microlevel, i.e. of different phases or around cracks and pores.

Tasks

- Literature study on algorithms for image analysis
- Selection of suitable algorithms and trial microstructures
- Implementation of algorithms & pre-/post-processing
- Testing on selected use cases and sensitivity studies
- Documentation (thesis / project report)
- Tasks will be adapted to type of thesis / project

Your profile

- Programming skills in Python, Matlab or similar
- Basic knowledge of materials science is a plus
- Self-reliance, reliability, thoroughness
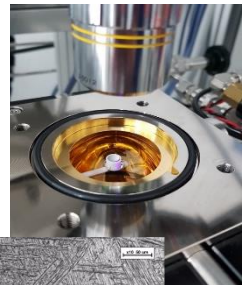
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