Karlsruher Institut für Technologie

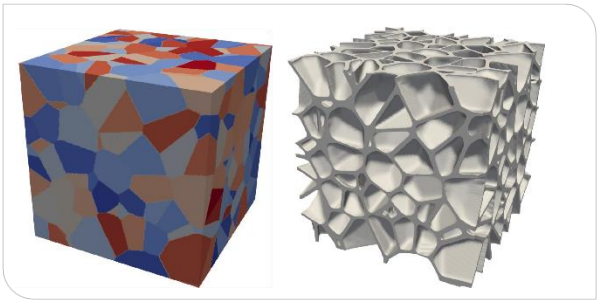
Master`s Thesis

IAM
Institut für Angewandte Materialien

Computer Simulation of foam structures as basis for „Machine Learning“

Background:

Polymer foams are used as templates in a new manufacturing approach towards solid metal foams. Porous foam structures with controlled mechanical properties can be tailor-made by selecting a morphology with certain geometric and structural material parameters.



The approach of machine learning provides a new and powerful possibility to generate a structure with optimal properties. The prediction of foam structure morphology via numerical simulation is key to the application of this innovative method.

Your Task:

In this thesis, the morphology of foams shall be studied numerically. The influence of material parameters on the development of the microstructure will be investigated in large-scale simulation studies. To map variable structures, a method is used which is well-established in the research group. The generated data set will provide a reliable basis for later work, applying machine learning algorithms.

Prerequisites:

Basic knowledge of materials science and physics is an advantage when working on the topic. Interest in numerical simulations as well as in familiarisation with new methods and topics should be present.

We provide:

- intensive supervision
- modern work stations and high performance computers as work environment
- productive and dynamic atmosphere in a team
- cooperations with international research groups
- career options as junior scientist

Curious?

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