Validation and development of welding simulations in a geometry assurance context

Background

The geometry assurance research group at the Department of Industrial and Materials Science, division Product Development is a large research group dealing with geometry assurance and robust design. Most of the work is done in close cooperation with industrial partners, such as Volvo Cars, Volvo Trucks and GKN Aerospace Systems Sweden AB.

One research challenge for the group is to predict geometrical variation in products and subassemblies. To do this, methods for simulation are developed and fine-tuned. Those simulation methods can then be used to compare predicted output with requirements on the final product.

For welded assemblies, the effects from welding must be included. Methods for this have been developed, but the simulations need to be validated against data from physical tests. The task in the master thesis is to run simulations in the software RD&T and compare with available test data, and suggest and test improved simulation methodologies. Much of the work will be done in close cooperation with Fraunhofer Chalmers Centre for Industrial Mathematics (FCC).

The position is well suited both for students with ambitions to start as doctoral students or students that want to work in industry.

Tasks

- Literature studies of geometry assurance, welding simulation and the methods developed at Wingquist Laboratory.
- Study the current working procedures used for welding in variation simulation.
- Run simulations and compare with test data.
- Suggest and evaluate potential for improvements.

Goals

- Validate the welding simulation
- Improve the simulation methodology
- Define technical requirements and limitations

Conduction

This thesis work needs to be conducted by two students. The time period is flexible, but preferable spring 2018.

Information

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