SUPER – Stuttgart University Program for Experiencing Research
Project Information

Institute’s Information
Name of Institute  Materials Testing Institute University of Stuttgart
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Duration of Project/Number of Students
June/July  
June/July/August  X
Number of Students  3

Name of Project  Finite Element Simulation of Additive Manufacturing and Welding Processes

Beneficial Skills & Knowledge  Materials Science, Strength of Materials, Welding, Computer Simulation

Description of Work
Additive manufacturing and joining technologies like friction stir welding, resistance spot welding and fusion welding are modern manufacturing technologies that are used to produce lightweight parts in automotive, aerospace, marine and railroad applications.

In all these processes, complex thermo-mechanical and thermo-electrical-mechanical interactions take place. The simulation of these manufacturing processes is therefore a challenging problem where many research questions are still to be solved.

We can host up to four students, processes that are investigated numerically are Selective Laser Melting (Additive Manufacturing), Friction Stir Welding, Resistance Spot Welding and Fusion Welding. All simulations are conducted with Abaqus. Tasks include the creation and modification of models, parameter studies and implementation of user-defined features.