



inspire AG is the leading Swiss competence center for product innovation and advanced manufacturing. As a strategic partner of ETH Zurich, our mission is to transfer knowledge and technology from research to Swiss machine, electrical and metal industries.

Physics-based and data-driven modeling of laser welding distortions

Position: Project Engineer 80-100% / PhD Research Assistant 100% (m/f/d)

This position is ideal for highly-qualified and motivated young scientists seeking to engage in an ambitious interdisciplinary research project with direct industrial applications. The project goals lie at the interface of process engineering, machine learning, and numerical simulation developments.

Project Background:

Automotive manufacturers face a critical challenge in their Body-in-White (BiW) assembly processes: designing optimal joining operations to prevent defects and meet strict tolerances. Currently, this process relies on time-consuming trial and error with physical prototypes. The limited adoption of simulation technologies in this domain is primarily due to the complexity of joining processes, necessitating engineering and numerical skills. Accurate welding simulations are also time-intensive, making them impractical compared to experimental trials. In collaboration with our industry partner, a global leader in sheet metal forming simulations, our mission is to address this challenge. We are committed to developing an accessible, user-friendly software suite that delivers rapid and precise simulations of laser welding distortions throughout the BiW process chain. Leveraging data-driven modeling and machine learning (ML) capabilities is instrumental to achieving this target, which will help optimize manufacturing workflows and reduce lead times.

Key Tasks & Responsibilities:

- Developing accurate process simulation and fast surrogate models for welding distortions.
- Conducting experimental campaigns and collecting sensor data for model V&V.
- Integrating efficient ML models into the software and implementing process-specific optimizations.

What You Offer:

- Master's degree in mechanical engineering, computational/data science, or a related subject.
- Proficiency in programming languages such as Python, C/C++, or CUDA.
- Strong numerical modeling skills and experience with ML.
- Professional command of English (written & spoken). Knowledge of German is a plus.
- Permission to work in Switzerland or EU/EFTA citizenship.

What We Offer:

- A collaborative and unique work environment that fosters application-driven research innovations.
- Access to state-of-the-art tools and resources to support your work.
- The chance to work with industry leaders and experts in automotive manufacturing and simulation.
- Possibility to obtain a PhD degree from ETH Zurich.

Interested & Eligible?

We look forward to receiving your complete application, which should include a letter of motivation, a detailed CV, transcripts of all obtained degrees (in English), and contact details for at least two referees. Please apply via email to Dr. Mamzi Afrasiabi (mamzi.afراسيabi@inspire.ch), the head of the Computational Manufacturing group.

This position will be available as soon as possible or upon agreement; the planned project duration is 3 years. The place of work is Zurich.