

# BACHELOR THESIS (M/F/D)

## ROBOT-PATH PLANNING FOR ADDITIVE MANUFACTURING IN ACCORDANCE WITH GEOMETRIC AND THERMODYNAMIC PROCESS BOUNDARY CONDITIONS

SOFTWARE FACTORY – YOUR PARTNER FOR DIGITAL TRANSFORMATION. As a long-standing software and technology partner to PTC, we develop specific modules and solutions for big-name companies worldwide in close cooperation with our customers. At our headquarters in Garching near Munich we are now looking for an addition to our team.

### The Research Project

In aviation, environmental conservation should be supported by reducing emissions per kilometer flown. This goal can only be achieved by reducing the weight of the aircraft, for example by using lightweight alloys such as titanium alloys. The production of structural components, which usually have small wall thicknesses of 2 to 3 mm, is carried out as a rule by machining from semi-finished products in the form of blanks from rolled blocks. As part of the REGULUS project, a process chain is being investigated which, through the combination of arc-based build-up welding with milling post-processing, should reduce the buy-to-fly ratio (ratio of raw material to component mass) from 25: 1 to 3: 1.

### Your Tasks

- Prototypical implementation of an automated layer generator for layers and simply curved surfaces
- Definition of a data format by representation of trajectories for the additive process, which includes all relevant process variables as degrees of freedom
- Investigating the possibility of analyzing and visualizing additive manufacturing processes in a CAx system.
- Visualize the trajectories for the additive manufacturing process.
- Examining, selecting, extending and adapting a post-processor for robotic code rejection for the additive manufacturing process based on the planned trajectories
- Implementation of the methods developed for the derivation of trajectories for additive manufacturing on the basis of the cutting geometry in a CAD system Creo

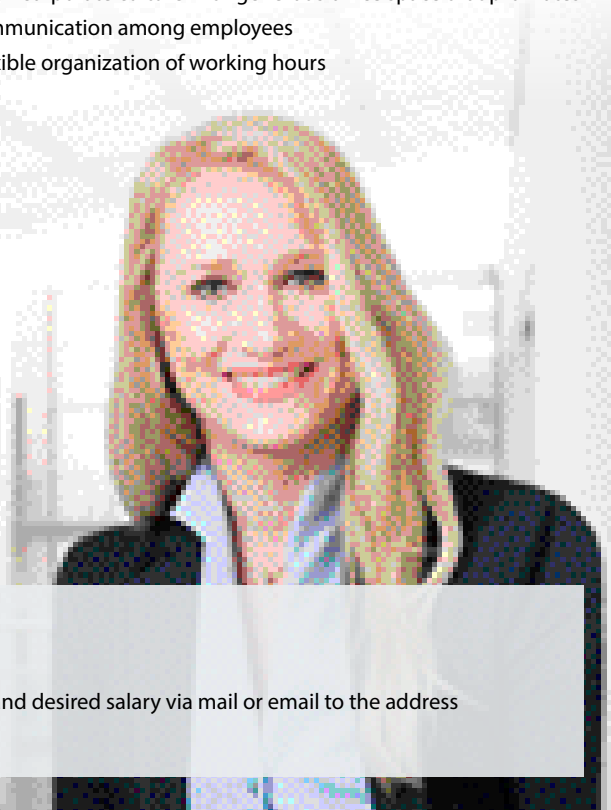
### Start of the bachelor thesis in the winter semester 2020-2021

### Your Profile

- Bachelor's degree in a STEM degree program
- Enthusiasm for IT
- Ideally first experience in high-level language (e.g., C ++)
- Excellent German and English language skills
- High level of willingness to learn and commitment
- Friendly and open demeanor

### What we offer you

- Collaboration in a dynamic and motivated team in a friendly working environment with flat hierarchies and direct communication
- Employment in a promising technology field with international orientation
- Workplace in an attractive location (Business Campus in Garching - 4 km from Forschungszentrum Jülich)
- Permanent employment prospects after graduation
- Open corporate culture with generous office space that promotes communication among employees
- Flexible organization of working hours



### Are you interested?

We are looking forward to your detailed application including your availability and desired salary via mail or email to the address indicated at the bottom of the page.



25 YEARS SF.

25 YEARS INNOVATION.

25 YEARS CUSTOMER SATISFACTION.



### Who we are

Software Factory optimizes horizontal data integration with tailor-made ON TOP solutions across the entire value chain. We are the partner for digital transformation in the context of Industry 4.0, smart production, mechatronics and Internet of Things.

BMW, Bosch, Siemens, TÜV and many more companies rely on our software solutions and our outstanding quality.

We are in close and active contact with universities, we educate, work in research projects and support the qualification of students with internships and theses.

Software Factory was founded by members of the Institute for Machine Tools and Industrial Management (iwb) of Munich's technical university (TU München) in 1992 and owns experience from more than 20 years in realizing challenging software projects and products.

### How we work

Software Factory plans and realizes systems and components for company-critical and company-wide processes. Our top priority is to increase and ensure the competitiveness of our customers with innovative and optimized solutions. We reach this goal by the team work of our professional and reliable employees, fairness and by open cooperation in partnership with our customers. Our employees are graduate computer scientists, business data processing specialists, mathematicians, engineers, natural scientists or qualified IT specialists which are trained by Software Factory. Satisfied customers and our employees are our main reasons for success.

### What we do

Companies are more and more rated on their level of innovation. The cooperation of disciplines, the synchronization of processes and data make the basis of Big Data and Industry 4.0. With our services Digital Engineering, Digital Manufacturing & Operations, Digital Service and Industrial Cyber Security companies are ahead of their competitors and in step with the time.

### What's in for you

At Software Factory, a practice-oriented task in a dynamic and friendly working environment in an attractive location in Garching near Munich is waiting for you! Look forward to great colleagues in our international team with flat hierarchies and direct communication and the ability to actively shape the company!

### Our Benefits

- 30 days leave
- Performance bonuses and incentives
- Individually tailored career development paths
- Meal allowance / access to medical fitness center in house
- Beverages freely available
- Car park
- Travel allowance
- Subsidized car-sharing scheme
- Assistance in finding accommodation
- Regular team events
- Bonus for successful staff recruitment

### Your opportunities at SF

Whether you are an intern, a student, a newcomer to the working world, transferring from another discipline or a seasoned professional; Software Factory has an attractive offer for every phase of your professional career.



Be in step with the time and shape the digitalization of the working world with us.

We are looking forward to working with you!



YOUR PARTNER FOR DIGITAL TRANSFORMATION

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