



Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich



Department of Management, Technology, and Economics
Chair of Production and Operations Management
www.pom.ethz.ch

Zurich, 13th January

Call for Master's Thesis FS 2025

In collaboration with Manukai, the Chair of Production and Operations Management offers a master's thesis for the spring semester 2025.

Topic: Machining Feature Detection in 3D Geometries

Industrial Partner: Manukai AG, Zürich

Manukai (www.manukai.ch), a spin-off from ETH Zurich, develops novel AI technologies to automate the programming of CNC machines for companies in the machinery, automotive, aerospace, watchmaking, and medical technology industry.

Project Description: Manukai employs machine learning methods to identify machining features in 3D geometries. Identified features can be classified, which is relevant for downstream task automation, such as the programming CNC machines.

The project consists of two main components:

- Improvement of the current ML pipeline, including information extraction from STEP files, ML architecture design, training, and computational performance optimization.
- Evaluation of the potential operational efficiency gains from the implemented procedure and discuss opportunities and challenges for implementation in real product development settings. This evaluation can be performed using either a real-world company scenario or a realistic case study.

Requirements: Knowledge of deep learning methods. Strong programming skills in Python and basic knowledge of Linux. Proactive problem-solving, the student anticipates challenges and uses critical thinking and creativity to overcome obstacles.

Organization: The project will be supervised by Dr. Daniel Wälchli at the Chair of POM. The duration of the project is 6 months, a workplace will be provided at Scheuchzerstrasse 7 during the runtime of the project. The student will obtain access to Manukais' development infrastructure (server and code). We are flexible in choosing a start date, ideally in FS 2025.

Application: Please send your application letter, CV, and transcripts to Dr. Daniel Wälchli (wadaniel@ethz.ch).