

Bachelor/Master Thesis:

Robot-based optical measurement of tool wear

Systems Engineering, Mechanical Engineering and Process Technology, Production Engineering, Industrial engineering

In the manufacturing industry, monitoring and predictive assessment of tool wear play an essential role. The goal is to reduce downtime, improve the quality of products, and optimize the efficiency of production processes. The implementation of advanced measuring sensors, along with the development of accurate prediction models, allows for effective control of tool status and refinement of machining processes. An initial step of particular importance is the precise capture of tool geometry and thus tool wear.

In the proposed work, an optical, chromatic-confocal sensor is integrated onto the arm of a controllable robot. Among other things, it must be clarified how the measurement deviation due to the robot's positioning deviation can be characterized and minimized. Finally, the robot-assisted sensor system is to be tested and used for determining the tool geometry.



Possible contents

- Programming of the Robot
- Ansteuerung eines chromatisch-konfokalen Sensors und taktile Referenzmessung
- Control of a chromatic-confocal sensor and tactile reference measurement
- Development of a compensation method using Matlab/Python to eliminate the systematic measurement deviation

Your profile

- Enthusiasm for optical metrology
- Joy in experimenting and analyzing
- Independent & responsible work

Contact:

Jiuzhou Xiang

☎ (0421) 218 – 646 08

@ j.xiang@bimaq.de

🌐 www.bimaq.de

✉ Universität Bremen, BIMAQ
Linzer Str. 13
28359 Bremen

(bimaq.de/de/lehre/abschlussarbeiten)

