Design and Development of Cutting Tools
Bachelor thesis / Semester Project / Master Thesis

Abstract
In next general of the industry, Industry 4.0, the cutting tools will not be designed by try and errors. Hybrid optimization consisting of experimental and numerical tasks will be employed to ensure development of innovative cutting-tools in low cost and minimum time-to-market, which will be employed in this thesis.

Materials with extraordinary properties are extensively developed and used in the past few decades. High performance machining of such materials are challenging in industry. These materials are widely used in various industries such as aerospace, biomedical and automobile industries. Some of the applications of such materials are shown in Fig. 1. There are some challenges in high performance machining of these materials. Design and development of new cutting tools, analysis of temperature, cutting forces and finally high performance machining are the goals of many researches. At inspire AG, several experimental and numerical setups are developed to reach these goals. Therefore, the goal of the current proposed thesis or semester project is to further develop those novel methods.

![Fig. 1: High performance machining of titanium alloys, used in aerospace and medical industry (Ref.: internet)](image)

Tasks
- Literature review (10%)
- Experiments and measurements: Experimental analysis of machining. Learning working with machine centers and other measurement devices. (30%)
- CAD designs. Learning working with CATIA (20%)
- Finite element analysis and optimizations (30 %)
- Documentation (10%)  

Requirements
- Study of the basics of the machining process
- Interest in experiments with machining centers and high-tech devices, such as Pyrometer, Dynamometer, and high speed camera (You will be trained)
- Interest in CAD, FEM and coding (You will be trained)

Start
As soon as possible, HS 2018 - FS 2019 - or upon agreement

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