
Project: Simulation-based Parameter Identification for Online Condition Monitoring of a Spindle Nut Drive (SIOCS)**JP Dr.-Ing. Sascha Röck**

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Summary

The objective of the proposed project is to develop a method for simulation-based condition monitoring of a spindle nut drive for machine tools. Thereby, parallel to the operation of the spindle nut drive, an automatic parameter identification of a corresponding simulation model is to be carried out with the aim to identify high-level information like stiffness and damping of the significant components based on the available drive signals. The underlying model for the identification will consist of finite element (FE) component models and the corresponding component parameters like stiffness and damping of the bearings, spindle nut, etc.. Beyond the parameter identification, the characteristics of the loads in the components will be computed online by the mentioned model. The identification and the calculation of the load is continuously carried out during the operation, so that time series of the parameters (parameter histories) can be recorded and used for the analysis of load, wear and life cycle and consequently for the maintenance management. The methods required for the load, wear and life cycle analysis also need to be developed and tested.

The project will be financed to 50% by the companies TRUMPF, CADFEM and ISG and the work schedule will be based on the requirements of the industry partners.