

## Science and Engineering Research Program 2020 Project Proposal

Hochschulbüro für  
Internationales /  
International Office

Uta Knoche/ Kristina Schmidt

Tel +49 511 762 2549  
Fax  
Uta.knoche@zuv.  
uni-hannover.de

Kristina.Schmidt@zuv.uni-  
hannover.de

institute: Institute of Assembly Technology (match)

project title: Increase of the flexibility of an aerodynamic  
feeding system

**project description:** To meet the demands for a highly flexible and simultaneously efficient feeding system for automated assembly, an aerodynamic feeding system has been developed at the Leibniz University of Hanover. The system uses a constant air jet to exert a force on components passing a nozzle. Using a genetic algorithm, the system is designed to adjust nozzle pressure, component speed and other parameters autonomously for an optimal output rate.

In order to minimize the setting time, the time the genetic algorithm requires to find a satisfactory combination system parameters, multiple approaches are being pursued. With the help of a model that solves the equations of motion of a component in the aerodynamic orientation process, good parameter combinations can be determined in advance. The development of a numerical simulation model is expected to further refine the prediction of the process parameters. But even without the application of simulation models, statements about the feedability of a component can be made by carrying out statistical tests targeted on individual component properties. A completely new approach is the use of digital image processing to evaluate the orientation process. Within the framework of this research project students have many possibilities to participate in the development of new methods aiming to decrease the setting time of the aerodynamic feeding system suitable to their interests and competences.

**required skills:** Applicants should enjoy doing research and become acquainted with new tasks. Experience in working with MATLAB/Simulink, ANSYS or Hyperworks is helpful but not explicitly required.

**contact/ supervisor:** Torge Kolditz, kolditz@match.uni-hannover.de