



Biomimetic Flexible Palm for a Robotic Hand

Bachelor's or Master's Thesis

The Institute of Robotics and Mechatronics of the German Aerospace Center has a legacy of developing outstanding robotic hands. In recent years, soft robotics and continuum joints have gained attention, as they provide intrinsic compliance, passive robustness and shock absorption, which facilitates safer human-robot-collaboration.

The student will iterate on the current prototype of a hybrid soft-rigid palm and improve the design in various aspects, esp. regarding structural stiffness and sizing. The development should be based upon thorough literature research about the details of human grasping and in-hand manipulation. FEM or other physics simulation tools, e. g. MuJoCo, will serve to analyse and evaluate different designs before implementing them physically. Subsequently, the simulation results can be validated by an experimental set-up to be developed by the student.



DLR David

Skills:

- Proficient in using CAD software (Creo or comparable)
- Experience with FEM simulation and rapid prototyping
- Solid knowledge about biomechanics

Tasks:

- Literature research on human grasping and in-hand manipulation
- Conception and evaluation of different designs for an anthropomorphic palm
- Construction of a 3D-printed prototype
- Experimental validation of simulation results
- [optional] Optimisation / revision of the tendon-driven palm actuation

This will be an on-site occupation at the German Aerospace Center in Oberpfaffenhofen.

Start: at the earliest possible date
Contact: oliver.neumann@dlr.de

Please enclose a short letter of motivation, your up-to-date CV and copies of relevant certificates.