Topic	**Exploring Gripping behaviours for handshaking**
Abstract	Handshaking as a synchronous haptic interaction actively involves sensing the pressure exerted by the partner and accordingly adjusting one's own force. This is an important aspect when it comes to robotic handshaking since touch can convey complex emotions. It is, therefore, important for a robot to be able to sense the partner during handshaking and respond adequately in a synchronous manner. (Image taken from [1])
Language	English
Exemplary Issues	In order to realize a synchronous handshaking, it is important to properly sense the force being exerted on the robot hand and respond in a timely manner. One such approach is presented by Vigni et al. [1] who estimate the human's force using sensors on a robot hand, that then adjusts itself to give a comfortable handshake. The focus of this thesis would be: • Implementing [1] on a Festo Bionic SoftHand [2] as a baseline for robotic handshaking. • Extending [1] to follow a more principled approach regarding the interaction modelling for handshaking. • Evaluate the differences between the proposed approach, the approach presented in [1] and a few other baseline behaviours.
Key References	[1] Vigni, F., Knoop, E., Prattichizzo, D., & Malvezzi, M., 2019. The role of closed-loop hand control in handshaking interactions. IEEE Robotics and Automation Letters. [2] BionicSoftHand, Festo A. G. https://www.festo.com/group/en/cms/13508.htm [3] Prasad, V., Stock-Homburg, R. and Peters, J., 2021. Human-Robot Handshaking: A Review. International Journal of Social Robotics. [4] Prasad, V., Stock-Homburg, R. and Peters, J., 2020, November. Advances in Human-Robot Handshaking. In International Conference on Social Robotics.

Additional Information	Start: as soon as possible Kind of thesis: Master/Bachelor thesis or Studienarbeit Requirements: Programming knowledge (Python/C++) Optional but preferred: Knowledge of ROS Publication options: High quality work would be submitted to international conferences.
Contact	The exact focus can be determined individually with the supervisors. The work is supervised by Prof. Dr. Dr. Ruth Stock-Homburg, Prof. Jan Peters and Vignesh Prasad at the Chair of Marketing and Human Resources Management. Contact: vignesh.prasad@tu-darmstadt.de