

MoveBots – Flexible Object Handling using Dexterous Grippers

Ph.d project by Jimmy Alison Jørgensen

Within recent years there has been an increased focus in flexible automation in industrial production. This focus is strongly related to the demand for small product batches and individually customized products. To enable such flexibility large machinery is exchanged or upgraded with high degree of freedom robot manipulators. These manipulators are programmable and multipurpose and often only limited by their gripper systems. These limitations are significant since the design and flexibility of the gripper determines which objects the system can handle. Current gripper systems are typically simple, they are sensorless, limited to open/close functionality and has a jaw like design. The geometry of the gripper jaws is designed such that a safe grip can be obtained of the objects that need handling. The design is developed manually in an iterative process using a combination of engineering and experimentation. This dissertation present work that focus on increasing flexibility of robotic grasping by using simulation tools, dexterous hands and tactile sensors. The work is centered on development of tools and methods for grasp planning, analysis and simulation. Overall the research contributes with valuable tools for increasing flexibility and robustness in robotic grasping where dexterous hands and tactile sensors are used.