Problem Description

The overall goal of this thesis is to identify how an autonomous and remotely operated robot can utilize visual sensors. This project is a continuation of several projects on the topic of mobile robotic maintenance. Therefore, the sensor applications should focus on maintenance tasks and movement of the mobile robot. The thesis should build upon the preceding project on this topic, which looked at depth perception for obstruction detection. To complete this goal, the student should:

1. Perform a literature review in order to gain knowledge on robotic maintenance and mobile autonomous robots.
2. Create a scope statement where the project goals are described as deliverables. The scope statement includes the description of a set of tasks with tangible and verifiable outcomes.
3. Present a set of development tools and hardware that are suitable in light of the goal above.
4. Propose a test platform for demonstrating some selected tasks performed by using vision based sensors. This platform may be based the existing mobile platform from the preceding project, either in its original or a modified form.
5. Develop solutions to at least one task that an autonomous maintenance robot could face, e.g. pick up an object, move to dock, or visual inspection. The solution must use a vision-based sensor to solve the task.
6. Assess the performance of the solution, and suggest improvements for the future.