

## Template for thesis project proposals

Project Title	Using barcode detection and decoding for mapping the infrastructure and inventory of warehouses
Author(s)	<i>Student(s) name(s)</i>
Keywords	Barcode, Inventory, Mapping
Project description	<p>This project [as a subset of AIMS project], targets the automation of forklift trucks in warehouse environments. The aim is to design a system for mapping of barcodes in a warehouse setting. Barcodes of interests are those located on pallet racks (beams) for identification of pallet rack cells and those located on individual boxes of different articles located on pallets. The goal is to generate a map (metric) of positions of barcodes found in the warehouse. The study also includes a comparison between a commercial barcode reader (from Cognex) and a custom built system based on a Gigabit camera (Prosilica) and an open source software for barcode detection (Zbar). Preferable the solutions are designed as ROS-packages.</p> <p>Resources: Facilities for data logging, cameras, barcode readers, laboratory equipped with a forklift truck for experiments, data logging equipment.</p> <p>RQ: Which system is best suited for bar code mapping in a warehouse? How can these systems be improved for faster and more accurate map building?</p> <p>WP1: Literature review and data acquisition.          WP2: Develop methods for barcode mapping using the different systems.          WP3: Comparison study and development of improvements of the different systems.          WP4: [bonus] conference publication (ETFA, ECMR, TAROS)          Deliverable: an implementation and demonstration of the developed system for bar-code mapping using data acquired in a real warehouse.</p>
References	<p>AIMS-project, <a href="http://islab.hh.se/mediawiki/AIMS">http://islab.hh.se/mediawiki/AIMS</a></p> <p>ROS - Robot Operating System, <a href="http://www.ros.org/">http://www.ros.org/</a></p> <p>ZBar bar code reader, <a href="http://zbar.sourceforge.net/">http://zbar.sourceforge.net/</a></p> <p>Stampfer, D.; Lutz, M.; Schlegel, C., "Information driven sensor placement for robust active object recognition based on multiple views," Technologies for Practical Robot Applications (TePRA), 2012 IEEE International Conference on , vol., no., pp.133,138, 23-24 April 2012, doi: 10.1109/TePRA.2012.6215667</p> <p>Karpischek, S., Michahelles, F., Fleisch, E., my2cents: enabling research on consumer-product interaction, Pers Ubiquit Comput (2012) 16:613622, DOI 10.1007/s00779-011-0426-9</p> <p>Han, Y., Sumi, Y., Matsumoto, Y., and And, N, .Acquisition of Object Pose from Barcode for Robot Manipulation, I. Noda et al. (Eds.): SIMPAR 2012, LNAI 7628, pp. 299310, 2012.</p> <p>G Meng, S Darman, Label and Barcode Detection in Wide Angle Image, Master Thesis, Halmstad University, Sweden, <a href="http://urn.kb.se/resolve?urn=urn:nbn:se:hh:diva-23979">http://urn.kb.se/resolve?urn=urn:nbn:se:hh:diva-23979</a></p>
Prerequisites	Image analysis, programming skills (preferably C++ or Python).
Time frame	January 2015 until June 2015, with possible extension until September 2015.
Supervisor(s)	Bjorn Astrand, Saeed Gholami Shahbandi,
Programme	Mobile and Autonomous Systems
Examiner	<i>Name of project Examiner</i>
Signatures	<p><i>Student(s):</i> _____ <i>Supervisor(s):</i> _____ <i>Examiner:</i> _____</p>