



Open PhD Position at the AASS Learning Systems Lab

3D Sensing for Autonomous Navigation

Open PhD Position

A new 3-year PhD position is immediately available at the AASS Learning Systems Lab, University of Örebro, Sweden.

Örebro University

The University of Örebro (<http://www.oru.se>) is a young university currently enrolling more than 14000 students. It is located in Örebro, a city with 100'000 inhabitants, which is situated in central Sweden at 59°16'N 15°13'E. More information about Örebro can be found, for example, at <http://en.wikipedia.org/wiki/Örebro>.



The AASS Learning Systems Lab

The Centre for Applied Autonomous Sensor Systems (AASS Research Centre, <http://aass.oru.se>) carries out multi-disciplinary research at the intersection of robotics, machine learning, artificial intelligence, computer vision, computer science, and measurement technology. The research and human environment at AASS is young and enthusiastic. Researchers come from different countries and have different scientific and cultural backgrounds. AASS also frequently hosts international researchers and is involved in several international projects. This means that, particularly in the DIADEM project, enrolled PhD students will have the opportunity to travel and to cooperate with people in other countries.



The Learning Systems Lab is one of three research groups within AASS. Our research is recognized world-wide with its focus generally on the development of algorithms and robotic/sensor systems for real-world tasks. Major directions are Mobile Robot Olfaction, Robotic Map Learning, Safe Operation in Dynamic Shared Environments, and Dexterous Manipulation and Motion Learning. Further information can be found at <http://www.aass.oru.se/Research/Learning>. Currently, the staff of the Learning Systems Lab includes 6 PhD students, 5 postdocs and 3 professors.



PhD Studies

The major part of the work can be dedicated to research in the area of *3D Sensing for Autonomous Navigation*. The aim is to investigate robot navigation based on 3D range sensing for the case of a single robot or a team of robots with or without the context of an environment that is equipped with stationary sensors in a wireless network (Ambient Intelligence). Thus, the following related problems will be addressed: world representation, optimal sensing strategies, sensor fusion, obstacle avoidance and path planning.

The enrolled PhD student will be involved in ongoing projects at the Learning Systems Lab for which the results of the work are relevant. This includes the EU project DustBot (<http://www.dustbot.org>, <http://www.aass.oru.se/~dustbot/>), the recently started project MALTA (<http://www.aass.oru.se/Research/Learning/malta/>) and a pre-study on underwater navigation.

The DustBot project is concerned with the development of a demonstration system for the management of urban hygiene with a network of cooperating robots embedded in an Ambient Intelligence infrastructure. The aim of the project MALTA is to develop a demonstrator platform of Multiple Autonomous Fork-Lift Trucks for Loading and Transportation Applications.

Apart from working towards the PhD thesis, the enrolled PhD student will be involved in the project work of the mentioned projects, which is expected to include occasional research visits of our European partners.

Prerequisites and Application Process

Apart from interest in the topic and solid programming skills, applicants should have the equivalent of a Masters degree in an appropriate field (for example: Robotics, Computer Science, Physics or Applied Mathematics). Previous experience with mobile robots is a plus. It is not necessary to be familiar with the Swedish language but proficiency in written/spoken English is mandatory.

To apply for the position, please send a motivation letter along with an updated CV (including at least two academic references) by e-mail to Achim Lilienthal (achim.lilienthal@tech.oru.se). Applications can be sent immediately and will be considered until the position is fixed.

We are looking forward to *your* application!

Dr. Achim J. Lilienthal (achim.lilienthal@tech.oru.se)
AASS Learning Systems Lab



The DustBot Project

The aim of the DustBot project is the development of a demonstration system for the management of urban hygiene using a network of autonomous and cooperating robots embedded in an Ambient Intelligence infrastructure. The robots will operate in partially unstructured environments (such as pedestrian areas) where they do vacuum-cleaning and transport small quantities of garbage.

The MALTA project

MALTA (Multiple Autonomous Fork-Lift Trucks for Loading and Transportation Applications) is a collaborative project between the AASS Research Centre at Örebro University, the Intelligent Systems Lab at Halmstad University and industrial partners from Danaher Motion, Stora Enso Logistics and Linde Material Handling.

The purpose of the project is to develop a demonstrator platform for a fully autonomous fork-lift truck that handles heavy products in an industrial setting. The autonomous trucks should be able to work safely together with other autonomous trucks and with manually driven trucks. They should be able to pick up (load) products, unload them, store them in containers or train wagons and possibly even stack them. The trucks should be able to do this with a speed that is comparable to the speed of trucks driven by humans.

The MALTA project is co-sponsored by the KK-foundation.

Practical Information – PhD Studies in Sweden

PhD students in Sweden are University employees and they have all the social and financial rights of other employees. Among these: a fixed monthly salary adequate to the cost of living in Sweden, inclusion in the Swedish social security system, and at least 28 days of paid vacation each year. These conditions are guaranteed for three years as long as the requirements for the PhD studies are fulfilled.

PhD students in Sweden have to take advanced courses during their study program. These are typically technical courses relevant to their research project, but may also be courses about other related disciplines, including scientific methodology and project management. Courses at AASS are meant to provide students with a unique educational background in autonomous sensor systems.

PhD candidates in Sweden must devote up to 20% of their time to institutional work. This work typically consists in helping with the undergraduate education. The percentage of time spent with institutional work is added to the total duration of the PhD studies.

In summary, the PhD students at AASS will be doing four sorts of things during their PhD: work on their research project; take graduate courses; contribute to undergraduate education; and participate in the scientific life of AASS and of the international community.

More information about the PhD studies at AASS can be found under

<http://www.aass.oru.se/Research/Learning/openphdposfaq.html>.

More Information

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Contact Person, Web Page:	http://www.aass.oru.se/Research/Learning/amll.html
DustBot Project:	http://www.dustbot.org , http://www.aass.oru.se/~dustbot/
MALTA Project:	http://www.aass.oru.se/Research/Learning/malta/
Learning Systems Lab:	http://www.aass.oru.se/Research/Learning/index.html
AASS:	http://www.aass.oru.se
PhD studies at AASS:	http://www.aass.oru.se/Research/Learning/openphdposfaq.html
Örebro University:	http://www.oru.se