

February 2008

Introduction

This newsletter is the first in a series of newsletters to appear during the spring semester 2008.

The robotics lab is the centre of activities related to robotics and automation at the faculty of engineering. The lab is the home of a number of major Research & Development projects including researchers, students on bachelor and master programs and industrial partners.

The lab is located in 'Hal J' at Niels Bohrs Allé 1.

The newsletter will report on activities taking place at the robotics lab.

Japanese visit in January



The 25th of January professor Sankai from University of Tsukuba in Japan had a brief visit here at the robotics lab. Prof. Sankai's research in cybernetics has led to the development of a wearable robotics suit called HAL (Hybrid Assistive Limb) mainly aimed at the health-care industry. The HAL suit is currently being marketed in Japan by the company Cyberdyne, and Prof. Sankai is preparing to bring the HAL suit to the European market. During

the visit at the robotics lab Prof. Sankai was especially interested in our hydraulic VGT robot, which is characterized by a high power to weight ratio. The visit was arranged by Søren Kleberg and Tine Hartmann Nielsen from Invest In Denmark. Web: Cyberdyne: www.cyberdyne.jp, Invest in Denmark: www.investindk.com.

Featured Robot: Thomas Priisholm's gripper

In December 2007 the RoboCatcher setup in the robotics lab got a new exciting upgrade in the form of a 3 finger pneumatic hand. The hand, including all mechanical and electrical design, was made by Thomas Priisholm from SDU Sønderborg as his

bachelor project in mechatronics engineering.

Each finger is actuated by a single pneumatic piston and has two joints. This makes each finger 'underactuated' which Thomas has taken advantage of in the mechanical design. The result is that the hand is able to grip and hold objects with a variety of different shapes, because of the inherent mechanical flexibility in the fingers.

The hand was primarily designed for the RoboCatcher to replace the old electromagnet used to 'hold' the car. With this visual servoing application in mind, Thomas has built a standard USB webcam into the hand to allow for an eye-in-hand approach in situations where the main camera mounted above the robot is obstructed.

In the spring semester we hope to attract students to make the necessary changes to the software currently driving the RoboCatcher, so the new improved RoboCatcher with hand can be ready for the Robots@Play festival in Odense this summer.



Semester kick-off

On Friday afternoon the 8th February all users of the robot lab met to mark the beginning of the spring semester. New students were introduced to the daily life at the lab, and the permanent staff of the lab were introduced.

Anders S. Sørensen encouraged everybody to take advantage of the large collection of knowledge present at the lab. The wide range of competences represented during the different backgrounds of the people in the lab facilitates interdisciplinary activities, which make synergies emerge and successful projects are the prize.

Wii, its alive!

It started last August as part play and part proof of concept. With the Nintendo Wii out and the internet flooding with people demonstrating new exiting ways to use its wireless motion sensitive joystick called the 'Wiimote', we decided to have a go at it here at the robot laboratory. 14 days later we had our 7 axis Mitsubishi PA10 robot equipped with a foam bat and an application running on SDU's RobWork high-level robot controller software.



With this setup we are able, in real-time, to steer the tool mounted on the robot just by moving and tilting the motion sensitive Wiimote. This turns the Wiimote into an extremely intuitive input device because the robot is effectively matching the position and orientation of the Wiimote in the hand of the user.

Currently present at the lab

SDU Institutes: Institute of Industrial and Civil Engineering (IB), Institute of Chemical Engineering, Biotechnology and Environmental Technology (KBM), The Maersk Mc-Kinney Moller Institute (MMMI), Institute of Sensors, Signals and Electrotechnics (SENSE)
External partners: MPN, RoboCluster, Scape, Teknologisk Institut, Universal Robots, Odense Technical College (OTS).



This has caught the interest of Inropa A/S, who develops software for painting-robots. Here the intuitive Wiimote could be used to teach the robot how and where to paint a new object. This would be an improvement over current solutions where the robot's motions has to be programmed in a robot programming language which is time consuming and requires expert knowledge.
Web: www.inropa.com

Coming events

During the semester a number of external persons will be invited to give talks on different subjects. The exact dates will soon be announced.

Colophon

This newsletter is published by the Robotics Lab at The Faculty of Engineering.

Editorial team

Palle Hermansen (pahe@mmmi.sdu.dk)
Anders S. Sørensen (anss@mmmi.sdu.dk)
Anders Bøgild (andb@mmmi.sdu.dk)
Dorthe Sølvason (dorthe@mmmi.sdu.dk)