

Introduction

RoboLab 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 and development projects including researchers, students on bachelor and master programmes and industrial partners.

The lab is located in 'Hal J' at Niels Bohrs Allé 1.
The newsletter will report on activities at RoboLab.

The MiniVGT setup

By PhD student Simon Falsig.

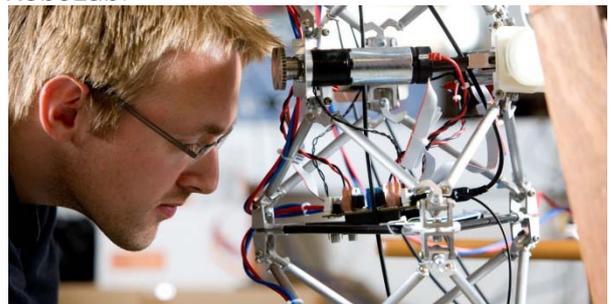
The NASA MiniVGT robot has been in Robolab for quite some time now, and it has been the subject of a number of different projects.



The latest is a complete redesign of the onboard electronics, with the major selling point being that the previous inflexible, monolithic controller has been replaced with a new distributed system. Even though the monolithic controller worked, it required the three sections of the robot to be connected through large, bulky, noise-susceptible ribbon cables, and if something was to be

modified (for example, addition of an extra section or a tool at the end of the robot) all the electronics had to be redesigned. Instead, the new controller uses one controller for each of the three sections and a fourth main controller to interface to the SDU LAN. The controllers communicate using the TosNet network, developed during my master thesis project this spring. TosNet is completely implemented in VHDL code in a Spartan3 FPGA and uses only two noise-immune, optical fibers to connect the sections. If functionality is to be added to the robot, it is easy simply to design an extra controller and connect it to the existing network - only minor changes to the main network controller are necessary in order to create a dataflow for the new controller.

The robot is controlled by a standard, wireless gaming joystick, connected to a PC running Microsoft Robotics Studio. A custom service has been created for this, implementing a (very) simple kinematics model for the robot as well as the necessary communication functionality, which sends data over the LAN connection to the robot. The setup works really well and has already been demonstrated a number of times to both potential and existing students as well as other guests at RoboLab.



CLAWAR 2008

Climbing And Walking Robots (CLAWAR) include some of the most spectacular examples of robotics. Thus, we were very excited about the opportunity to peek into this corner of robotics, as we have not seen many of these types of robots in Odense. Some of the most impressive examples were a 'dance partner' robot for waltzing and prototype micro robots, the size of bacteria and able to swim in the same way as bacteria and sperm cells.



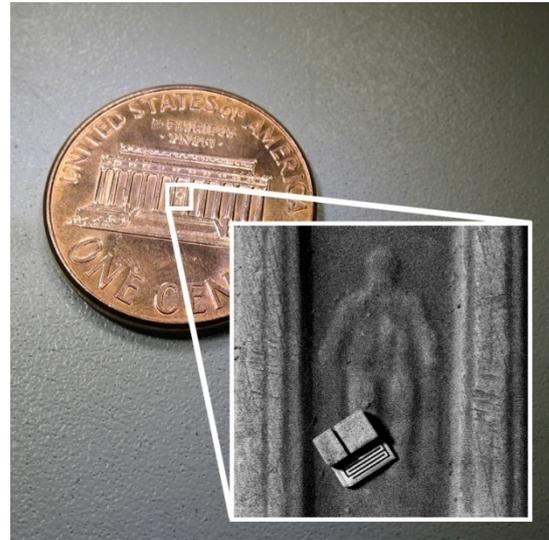
The dance partner robot was presented by Professor Kazuhiro Kosuge, Tohoku University, Japan. Read more on:

<http://www.irs.mech.tohoku.ac.jp/>

The conference

The conference was held in September at the University of Coimbra, Portugal. During the three days conference, 150 papers were presented in three parallel sessions, covering topics ranging from design and implementation of climbing mechanisms, over sensor and navigation techniques, to the support technologies needed to develop such robots.

In fact, the scope of CLAWAR is quite wide, as a broad range of support technologies are included in the scope. In fact, most presentations did not feature a climbing or a walking robot, but were concerned with some support technologies, which could equally well be applied in other fields.



Micro robot by Professor Bradley J. Nelson, ETH Zürich, Switzerland.

Our presentation

We attended CLAWAR to present a paper about a tactile sensing technique, known as palpation, in a special session about 'grasping and manipulation'. We are developing the technique for the RoBlood project, but the basic technology can also be used to assess the parameters of e.g. a gripping, walking or climbing surface. The experimental work was done as RoboLab bachelor projects, by Emil Pedersen and Anders Glent Buch, supervised by Thiusius Rajeeth Savarimuthu. The paper was written by Anders Stengaard Sørensen and Thiusius Rajeeth Savarimuthu. Anders Sørensen presented the paper in Portugal.

Colophon

This newsletter is published by the RoboLab at the Faculty of Engineering.

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