Alexander Skoglund, Ph.D. (1976-02-28)

CONTACT INFORMATION

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EXPERIENCE SUMMARY

Methods

Scientific and engineering skills: Robotics, scientific methods, machine learning, computer vision, computer graphics, scientific writing, real time programming, embedded systems.
Programming languages: C and C++, MATLAB (and GNU Octave) and Python (basic user).
Electronics: System design, analogue design, filter design, PCB design (prototype and production), test and measurement, board bring-up.
Work methods: Agile (scrum) and lean.

Tools

Software development: GNU eco system (GCC for ARM/AVR/MSP430, make, gdb, openocd, avrdude), Atmel Studio, Microchip's XC compiler, IAR Workbench, VSCode, Emacs, Eclipse (multiple derivatives), Jenkins and Unity for Unit testing.
Host environment: GNU/Linux since 2002. Several years of experience with Apple's OSX.
Version management: Git (Bitbucket, Github, Gerrit) and Subversion.
Documenting: JIRA, LaTeX, Doxygen and Wikis.
Protocols: I^2C, SPI, UART, RS232, CAN, USB, TCP/IP sockets.
Electronic design: LTSpice, CadSoft Eagle, KiCad, gerbview.
Instrument: Multimeter, oscilloscope, logical analyser, protocol analyser, surface mounted soldering.
Misc: ROS, OpenGL, OpenCV, firewire.

Microcontrollers and boards ARM Cortex M4 (XMC44XX, STM32F4), ARM Cortex M0 (BlueNRG), AVR (STK500, Arduino etc.), MSP430 (TI LaunchPad), STM8 and Microchip dsPIC33EP.

Currently learning: NodeJS and KiCad.

PRESENT POSITION

Scanreco, Stockholm, Sweden
Senior Embedded Systems Engineer **From 2019-04**
Working with firmware for the next generation of Scanreco's professional remote controls. Primarily working with the Bluetooth connectivity for firmware upgrades (bootloaders) and remote configuration with back end.

PROFESSIONAL EXPERIENCE

Realtime Embedded, Stockholm, Sweden
Firmware/hardware engineer **From 2017-03 – 2019-03**
Working with electronics and firmware design for RTE's clients. Primarily working on system design and firmware for hardware interaction, and also electronic development and board bring-up. The largest project involved power control, CAN communication and bootloading (among others).

BioServo Technologies, Stockholm, Sweden
Firmware/hardware engineer **From 2014-02 – 2017-02**
Working on electronic and firmware design on BioServo's SEM glove and next generation of BioServo's products. Primarily working on electronic development, board bring-up, system design and firmware for hardware interaction. Responsible for software in a scientific project to evaluate BioServo's product. Also maintaining current production version with upgrades and production support.

ÅF Group, Stockholm, Sweden *Embedded Software Eng.* **2012-11 – 2014-02**
Working on firmware design for client's embedded systems. *Project 1:* embedded Linux on ARM for an autonomous mobile robot. *Project 2:* embedded Linux web server on a RaspberryPi, short investigation and demo mock-up. *Project 3:* PWM control using an MSP430, short investigation. *Project 4:* control of an electrochromic foil (AVR) and powerline communication (LonTalk), 9 months.

Karolinska Institute, *Research Engineer*, Stockholm, Sweden **2009-12 – 2012-11**
Research Engineer in Brain, Body & Self Laboratory (Ehrsson group), at the Department of Neuroscience. My main task was to develop custom electronics and software for research in neuroscience. I worked on developing an MR compatible robotic anthropomorphic hand for neuroscience research on body perception, body ownership, agency, and prosthesis.

Örebro University, *Research Assistant*, Örebro, Sweden **2009-06 – 2009-12**
Work on modelling of human grasping strategies. Modelled grasping skills should be possible to transfer to dexterous robotic hand. This work is part of the HANDLE project, funded by EU:s FP7.

Örebro University, *Ph.D Student*, Örebro, Sweden **Nov, 2003 – June, 2009**
Research on Programming-by-Demonstration including learning systems, human-machine interfaces, human-like motions. In addition, I have been a teaching assistant in several courses. On parental leave in 2008-02–2008-05 and 2008-12–2009-01 (50%).

Örebro University, *Research engineer*, Örebro, Sweden **June, 2001 – Nov, 2003**
Maintenance with mobile robots and lightweight manipulators. Also, involved in the electronic design of an electronic tongue for water quality assessment, control system for manipulators, range finding sonar for manipulation.

Aerotech Telub, *Radio engineer*, Arboga, Sweden **Jan, 2000 – June, 2001**
Carried out several consulting projects associated with a short range radio for the take off team around the fighter aircraft SAAB JAS Gripen. I was involved in preliminary radio measurements for installation of a radio system in the metro of Barcelona.

Education

Örebro University, Örebro, Sweden

- Ph.D., Computer Science, *Programming by Demonstration of Robot Manipulators* 2009.
- M.Sc., Electrical and Electronic Engineering, December 2002.
- B.A., Electrical Engineering, September 1998.

Academic skills

During my Ph.D. my research field was within imitation learning, where a robot learns a task by observing a human. Learning should then continue to improve the performance by further self-observation or by providing more knowledge from the demonstrator (teacher). The main application is to simplify the programming process of an industrial manipulator (robot arm), a.k.a. "Programming-by-Demonstration".

I have supervised two master theses:

- Sofia Cruz-Ferreira Fröman, master thesis: *An actuated rubber hand for use in MRI environments.* KTH (Royal Institute of Technology, Stockholm).
- Guiseppe Valerio's master thesis on a medical diagnostic application. Chalmers University of Technology, Göteborg.

Teaching class **September 2009 - December 2009**
Introduction to Robotics and Intelligent Systems, Master Course. Autumn 2009. An introductory course in robotics. Topics covered: Robotic history, actuators, manipulation, sensing and perception, localisation, navigation, mapping, state estimation, dead reckoning, Bayesian filters and multi robot applications.

Teaching Assistant **August 2004 - January 2008**
Duties at various times have included office hours and leading weekly computer lab exercises.

- TDD121/PRG045 Programming in C, Winter 2006 and 2007.
- TDM136 Methods for Modelling, Simulation and Visualisation, Fall 2007.
- TDD112 Computer Graphics, Fall and Autumn 2004, Autumn 2005, Fall 2006, Fall 2007.