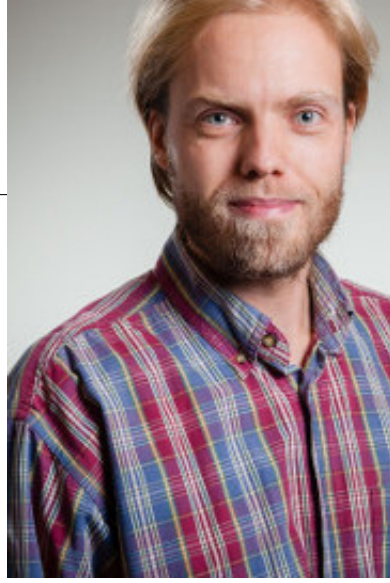
Simon Holmbacka. PhD – Resume
13 July 2016



CONTACT INFORMATION

Embedded Systems Laboratory
Faculty of Science and Engineering
Åbo Akademi University, Finland

Frantsinkatu 2 B 9
20540 Turku, Finland
Tel: +358 50 5310467
Email: sholmbac@abo.fi
Gender: male
Time of birth: 24.01.1986
Place of birth: Jakobstad, Finland
Nationality: Finnish

POSITION

Post-Doc Researcher **January 2016 –**
Åbo Akademi University Finland. Faculty of Science and Engineering,
Embedded Systems Laboratory.
Task: *Post-doc research and teaching*

Wissenschaftlicher Mitarbeiter **September 2015 –**
Fernuniversität in Hagen, Germany. Lehrgebiet Parallelität & VLSI
Task: *Post-doc research and teaching*

EDUCATION

Åbo Akademi University, Finland

Doctor of Technology in Computer Engineering (26 Jan. 2016, Turku, Finland) **2011 – 2015**

- Faculty: Science and Engineering
- Major: Embedded Computer Systems
- Minor: Software Engineering
- Minor: University Pedagogics
- Thesis: *Energy-Aware Software for Many-Core Systems* **Grade:** Honorary Grade
- Reference: Prof. Johan Lilius *johan.lilius@abo.fi*

Master of Science in Computer Engineering (31 Mar. 2011, Turku, Finland) **2009 – 2011**

- Institution: Information Technologies
- Major: Embedded Computer Systems
- Minor: Control Engineering
- Minor: Software Engineering
- Thesis: *Task Migration in Virtualized Multi-Core Real-Time Systems* **Grade:** 5/5

Bachelor of Science in Computer Engineering (6 Oct. 2009, Turku, Finland) **2006 – 2009**

- Institution: Information Technologies
- Major: Embedded Computer Systems
- Minor: Software Engineering

ABOUT ME

I come from the small city of Jakobstad in the mid west of Finland from which I moved to Turku to study computer engineering in 2006. I completed my Master's degree in 5 years (2006 – 2011) and my PhD in 4 years (2011 – 2015) from Åbo Akademi University in Turku, Finland.

Technical

I have worked extensively in the areas of embedded systems, runtime systems, power management and many-core platforms, which includes foremost low level system programming (usually in C). Furthermore I have experience in object oriented programming languages, mostly C++ and Java, and I have of course stumbled upon some Python, C#, .net, VB, Java script, xml and assembly progamming. I have worked with system modeling, mathematical optimization and control theory including NLP optimization, digital filtering, plane fitting methods, control theory and its underlying mathematics. This means that I have very good knowledge of Matlab, its toolboxes and system simulation in Simulink. On the hardware side, I have excellent knowledge of ARM and Intel platforms in particular, and system/kernel programming using Linux. I have been hacking with the Linux kernel since I was 16 years old and know this world in and out. From my PhD work, I created an Android app called "Low Energy Player" freely available on Google Play. On further lower level I have worked with real-time operating systems like FreeRTOS during my PhD and I have also build many hobby projects from scratch using micro controllers such as an audio synthesizer complete with a midi interface and USB driver running on an 8-bit AVR.

Project Work

In the 4 years of making my PhD I have published over 15 international peer reviewed scientific articles, one of which I received the best paper award for in 2014. I worked in the European FP-7 project RECOMP from 2011 – 2014 and in the national Tekes project ParallaX from 2014 – 2016, in which I worked together with universities and international IT companies like Wittenstein ltd., UK and Seven Solutions, Spain on programming and integration tasks. I am a very good team worker, which has shown in co-operations with 7 different universities in 4 countries during this time for my thesis, and outside of my thesis I have published work together with 12 different institutions and co-authored work together with over 30 people. I have visited more than 30 countries in my thesis work, and I find it very easy to join a team and start working on new projects with new people.

Languages

- Swedish: Mother tongue
- Finnish: Conversational
- English: Fluent
- German: Conversational

Pedagogics

Education wise, I have been lecturing university courses in English since 2013 and completed university pedagogics as a minor subject. I created an online education MooC on coursera.org from scratch in the EIT Digital project in 2015 and 2016, which is now freely available on Coursera and has over 2500 active students. https://www.coursera.org/learn/real-time-systems/

About Simon

I would describe myself as a person who takes the initiative and gets things started. I have a very good working discipline with regard to time and responsibility, and *I always do the work today instead of leaving it until tomorrow*! I always start a task well on time, and I keep the promised timelines whether it is a question of delivering C code, an article, a presentation, course material or a PhD thesis.
My hobbies – besides embedded systems hacking – are traveling, gardening, skiing, hiking and workout.

Teaching Experience

Course creator and lecturer: EIT Digital Online Coursera
Development of Real-Time Systems **Spring 2016**
https://www.coursera.org/learn/real-time-systems/

Advisor and examiner for thesis work: Åbo Akademi University **2012 – 2016**
Prüfer für Abschlussarbeiten: FernUniversität in Hagen **2015 – 2016**

Course lecturer: Real-Time Systems Åbo Akademi University **Spring 2016**
Course assistant: Multimedia Algorithm Implementations Åbo Akademi University **Spring 2016**
Course lecturer: Real-Time Systems Åbo Akademi University **Spring 2015**
Course lecturer: Real-Time Systems Åbo Akademi University **Spring 2014**
Course lecturer: Real-Time Systems Åbo Akademi University **Spring 2013**
Course assistant: Multimedia Algorithm Implementations Åbo Akademi University **Spring 2013**
Course lecturer: Real-Time Systems Åbo Akademi University **Spring 2012**
Course assistant: Real-Time Systems Åbo Akademi University **Spring 2011**

Research Visits

Rennes 4 month research visit
Location: Rennes, France
Institution: Institut national des sciences appliquées de Rennes
Host: Maxime Pelcat, ITER Laboratory
Duration: **November 2013 - March 2014**

Joint-Cooperation

Green Energy Cloud Simulation
Partners: Enida Sheme, Polytechnic University of Tirana, Tirana, Albania
Dražen Lučanin, TU Vienna, Vienna, Austria
Duration: **August 15 - November 30 2015**

Energy Efficient Cloud Simulation
Partners: Dražen Lučanin, Ilia Pietri, Ivona Brandić, TU Vienna, Vienna, Austria
Duration: **May 15 - May 30 2015**

Power-Aware HEVC Decoding with Tunable Image Quality
Partners: Erwan Nogues, Maxime Pelcat, INSA de Rennes, France
Duration: **Winter 2014**

Barrelfish port for Tilera Tile64
Partners: Xiaowen Wang, Robert Radkiewicz, Mats Brorsson, SICS, Stockholm, Sweden
Duration: **Summer 2013**

Task Migration Mechanism for Distributed Many-Core NoC Systems
Partners: Mohammad Fattah, Amir-Mohammad Rahmani, University of Turku, Finland
Duration: **Spring 2013**

Safe Motor Controller in Mixed-Critical Environment with Runtime Updating Capabilities
Partners: José Luis Gutiérrez, University of Granada, Spain
Miguel Méndez, Seven Solutions Inc., Spain
Duration: **November 5 - November 17 2012**

Safe core-to-core channel implementation
Partners: William Davy, Wittenstein Inc., UK
Duration: **May 23 - May 24 2012**

Grants

Tekniikan edistämissäätiö **2013**
For thesis on energy aware software, 5000€
Svenska tekniska vetenskapsakademien i Finland **2013**
For research visit to Rennes, France, 2500€
Otto Malms stiftelse **2014**
For thesis on energy aware software, 5000€
Svenska tekniska vetenskapsakademien i Finland **2015**
For research visit to FernUniversität in Hagen, Germany, 4500€
Oskar Öflunds stiftelse **2016**
For research co-operation with FernUniversität in Hagen, Germany, 3000€
Waldemar von Frenckells stiftelse **2016**
For research on energy aware software, 5000€

Work Experience

Åbo Akademi University, Turku, Finland
Post-Doc Researcher **January 2016 –**
Fernuniversität in Hagen, Hagen, Germany
Wissenschaftlicher Mitarbeiter **September 2015 –**

Åbo Akademi University, Turku, Finland
PhD Student **March 2011 – December 2015**
Research assistant **April 2010 – March 2011**

Brisa Inc., Pedersöre, Finland
IT manager **May 2009 – September 2009**

Herrmans Inc., Pedersöre, Finland
IT support **May 2008 – September 2008**

Brisa Inc., Pedersöre, Finland
Webshop assistant **May 2007 – September 2007**

Digicomp Inc., Jakobstad, Finland
Sales person **July 2006 – September 2006**
Technical support **May 2005 – January 2005**

Thesis

Simon Holmbacka: *Energy Aware Software for Many-Core Systems*, Faculty of Science and Engineering, Åbo Akademi University, 2015, Turku, Finland

Publications – Journals

Simon Holmbacka, Dražen Lučanin , Ilia Pietri, Ivona Brandic, Johan Lilius, Rizos Sakellariou: *Performance-Based Pricing in Multi-Core Geo-Distributed Cloud Computing*, *IEEE Transactions on Cloud Computing*, IEEE 2016

Simon Holmbacka, Jörg Keller, Patrick Eitschberger, Johan Lilius: *Accurate Energy Modeling for Many-Core Static Schedules with Streaming Applications*, *Microprocessors and Microsystems, Elsevier*, 2016

Simon Holmbacka, Erwan Nogues, Maxime Pelcat, Sébastien Lafond, Daniel Menard, Johan Lilius: *Energy-Awareness and Performance Management with Parallel Dataflow Applications*, *The Journal Signal Processing Systems. Springer US*, 2015

Jose-Luis Gutiérrez-Rivas, Simon Holmbacka, Miguel Míndez-Macías, Wictor Lund, Sébastien Lafond, Johan Lilius, Javier Díaz-Alonso: *Safe Motor Controller in a Mixed-Critical Environment with Runtime Updating Capabilities*, *Journal of Universal Computer Science*, 2015

Simon Holmbacka, Mohammad Fattah, Wictor Lund, Amir-Mohammad Rahmani, Sébastien Lafond, Johan Lilius: *A Task Migration Mechanism for Distributed Many-Core Operating Systems*, *The Journal of Supercomputing. Springer US*, 2014

Publications – Proceedings

Enida Sheme, Neki Frashëri, Simon Holmbacka, Sébastien Lafond, Dražen Lučanin *Datacenters Powered by Renewable Energy: A Case Study for 60 Degrees Latitude North Seventh symposium on green networking and computing (SGCN 2016)*, 2016, Split, Croatia

Simon Holmbacka, Jörg Keller, Patrick Eitschberger, Johan Lilius: *Accurate Energy Modelling for Many-Core Static Schedules Proceedings of the 23rd International Euromicro Conference on Parallel, Distributed and Network-based Processing*, 2015, Turku, Finland

Simon Holmbacka, Sébastien Lafond, Johan Lilius: *Performance Monitor Based Power Management for big.LITTLE Platforms HiPEAC Workshop on Energy Efficiency with Heterogeneous Computing*, 2015, Amsterdam, Netherlands

Simon Holmbacka, Erwan Nogues, Maxime Pelcat, Sébastien Lafond, Johan Lilius: *Energy Efficiency and Performance Management of Parallel Dataflow Applications* [**BEST PAPER**] *The 2014 Conference on Design & Architectures for Signal & Image Processing*, 2014, Madrid, Spain

Erwan Nogues, Simon Holmbacka, Maxime Pelcat, Daniel Menard, Johan Lilius: *Power-Aware HEVC Decoding with Tunable Image Quality 2014 IEEE Workshop on Signal Processing Systems*, 2014, Belfast, UK

Fredric Hällis, Simon Holmbacka, Wictor Lund, Robert Slotte, Sébastien Lafond and Johan Lilius: *Thermal Influence on the Energy Efficiency of Workload Consolidation in Many-Core Architecture*, *Proceedings of the 24th Tyrrhenian International Workshop on Digital Communications*, 2013, Genoa, Italy

Simon Holmbacka, Wictor Lund, Sébastien Lafond, Johan Lilius: *Lightweight Framework for Runtime Updating of C-Based Software in Embedded Systems*, *5th Workshop on Hot Topics in Software Upgrades*, 2013, San Jose, US

Simon Holmbacka, Wictor Lund, Sébastien Lafond, Johan Lilius: *QoS Manager for Energy Efficient Many-Core Operating Systems*, *21st Euromicro International Conference on Parallel, Distributed and Network-Based Processing*, 2013, Belfast, UK

Simon Holmbacka, Dag Ågren, Sébastien Lafond, Johan Lilius: *Task Migration for Dynamic Power and Performance Characteristics on Many-Core Distributed Operating Systems*, *21st Euromicro International Conference on Parallel, Distributed and Network-Based Processing*, 2013, Belfast, UK

Simon Holmbacka, Johan Lilius: *Evaluation of CPU Hotplug Latency on Multi-Core ARM Chips*, *Seventh Swedish Workshop on Multicore Computing*, 2014, Lund, Sweden

Simon Holmbacka, Sébastien Lafond, Johan Lilius: *Power Optimized Many-Cores with User Centric Notion of Parallelism*, *Sixth Swedish Workshop on Multicore Computing*, 2013, Halmstad, Sweden

Simon Holmbacka, Sébastien Lafond, Johan Lilius: *Towards Increasing Energy Scalability in Many-Core Systems*, *1st ASPLOS Doctoral Workshop*, 2012, London, UK

Simon Holmbacka, Sébastien Lafond, Johan Lilius: *A PID-Controlled Power Manager for Energy Efficient Web Clusters*, *International Conference on Cloud and Green Computing*, 2011, Sydney, Australia

Simon Holmbacka, Sébastien Lafond, Johan Lilius: *Power Proportional Characteristics of an Energy Manager for Web Clusters*, *11:th International Conference on Embedded Computer Systems: Architctures, Modeling and Simulation*, 2011, Samos, Greece

Simon Holmbacka, Jens Smeds, Sébastien Lafond, Johan Lilius: *System Level Power Management for Many-Core Systems*, *uPM2SoC workshop, DATE '11 Conference*, 2011, Grenoble, France

Simon Holmbacka, Sébastien Lafond, Johan Lilius: *Generic QoS Manager for Many-Core Service-Based Operating Systems*, *Fourth Swedish Workshop on Multicore Computing*, 2011, Linköping Sweden

Publications – Non-peer-reviewed

Simon Holmbacka Fredric Hällis, Wictor Lund, Sébastien Lafond and Johan Lilius: *Energy and Power Management, Measurement and Analysis for Multi-Core Processors TUCS Technical Reports 1117*, 2014, Turku Centre for Computer Science

Registered Inventions

Simon Holmbacka (100%): *Power management with performance monitoring for computer systems*
Coordinator: Olle Lagerroos, June 2015, Åbo Akademi University

Referees

Prof. Johan Lilius
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