MartinSöderén

Master of Science in Computer Science and Engineering

contact

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languages

Swedish - mother tongue
English - fluent
German - basic
French - basic

programming

C
C++
Python
VHDL
BASH
Make
CMake
Java
LaTeX

Skills

Parallel programming	**Designing parallel analysis applications using the most efficient algorithms and synchronization methods for a particular problem**
GPGPU development	**Developing real-time digital signal processing analysis applications for GPUs using either CUDA or OpenCL**
Code optimization	**Profile and optimize code using all of the available tools**
Control applications	**Developing real-time control applications for critical systems**
Linux device drivers	**Developing Linux device drivers for PCIe-based high-performance acquisition cards**
Linux administration	**Setting up, tuning, and administrating critical Linux systems**
UI design	**Developing complete user applications using Qt or PyQt**

Experience

2021–now **Staff, CERN, Geneve** — Full time
Continuing my work on acquisition and analysis systems while being responsible for the operation of certain critical systems

2018–2021 **Fellow, CERN, Geneve** — Full time
Developing new real-time acquisition and analysis systems for all accelerators. This involved firmware, driver, and analysis application development and the deployment and support of the systems

2016–2017 **Technical student, CERN, Geneve** — Student program
Developing applications for analyzing gigabit data-stream in real-time

08–12 2016 **Linköping University, Linköping** — Summer job
Software developer for AIICS

08–12 2015
08–12 2014 **Linköping University, Linköping** — Part time
Course assistant in Perspectives in Computer Science and Computer Engineering

06–08 2015 **SAAB, Linköping** — Summar job
Software developer

06–08 2015
06–08 2014 **Linköping University, Linköping** — Summer job
Software developer

11–12 2014 **Linköping University, Linköping** — Part time
Course assistant in Introduction to design and product development

06–08 2014
06–08 2013
06–08 2011 **Silex Microsystems, Stockholm** — Summer job
Process operator working with photolithography

Education

2021 **Expert VHDL** — DOULOS, CERN

2018 **Comprehensive VHDL for FPGA Design** — DOULOS, CERN

2018 **CAS - Introduction to Accelerator Physics** — CERN

2017	**Thematic CERN school of Computing**	CERN
2011–2017	**M.Sc in Computer Science and Engineering**	Linköping University
2009–2010	**Engineering preparatory year**	KTH Royal Institute of Technology
2006–2009	**Social studies with major in economics**	Blackebergs gymnasium

Publications

06-2022	**Reconstruction of transverse phase space from transverse feedback data for real time extraction of vital LHC machine parameters** IPAC paper	CERN, Geneva
06-2022	**Digital low-level RF system for the CERN Linac3 accelerator** IPAC paper	CERN, Geneva
08-2020	**ADTObsBox to catch instabilities** MCBI proceeding	CERN, Geneva
11-2019	**Low Latency, Online Processing of the High-Bandwidth Bunch-by-Bunch Observation Data from the Transverse Damper Systems of the LHC** CHEP paper	CERN, Geneva
10-2017	**Online coupling measurement and correction throughout the LHC cycle** ICALEPCS paper	CERN, Geneva
09-2017	**ADT And OBSBOX In LHC Run 2, Plans For LS2** LHC Operations procedding	CERN, Geneva
09-2017	**Online Transverse Beam Instability Detection in the LHC High-Throughput Real-Time Parallel Data Analysis** Master thesis	CERN, Geneva
05-2017	**Usage of the Transverse Damper Observation Box for High Sampling Rate Transverse Position Data in the LHC** IPAC paper	CERN, Geneva
05-2017	**Online Bunch by Bunch Transverse Instability Detection in LHC** IPAC paper	CERN, Geneva
05-2015	**Development of a quadratic programming solver for model predictive control** Bachelor thesis	SAAB, Linköping

Private Projects

2022	**AVX512VectorLib** A vector operations library that utilizes AVX512 instructions
2020	**HDLCompiler** A VHDL/Verilog compiler for real-time semantic analysis
09-2019	**Super Plastic Synchrotron** A working model of a particle accelerator for CERN open days
09-2017	**ConcurrentDataSharer** Publish-subscribe pattern middleware for easy data sharing
06-2016	**FPGAComputer** Complete computer implemented in VHDL
06-2016	**3DFileManager** A 3D file manager implemented in OpenGL
12-2015	**matLib** A barebone matrix/vector library

Interest

Mechanical Engineering, Robotics, Snowboarding, Swimming, Traveling, Hiking, and Motorcycles.