

Personal details:

Name: **Dr. Attila Hidvégi**
 Date of birth: 1979-04-19
 Gender: Male
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**Education and qualifications:**

2012:	Stockholm University – Physics Dept. Ph.D. in Physics , in the field of instrumentation physics.
2002:	Stockholm University – Physics Dept. Fil.Mag. in Physics , with focus on electronics
1998:	ÅSÖ Gymnasium – Upper Secondary School – Technical Science

Profile:

I have an interest for advanced electronics, computer science, technology and scientific research in different fields. I have my degree from the Physics department at the university, with focus on instrumentation and electronics. I have been interested in computers and technology since young age, and have a technical background. I like challenges which can improve my skills and I like to learn new useful subjects which broadens my knowledge. I also like to create new projects, where I can develop new skills, instead of just waiting for such opportunities to pop up.

Skills:

- **High speed electronic development:** Development of high speed electronic systems for data acquisition, signal processing and control systems. Designs based on FPGAs, MCUs and SoCs. Schematic capture, PCB layout, pre- and post-layout signal integrity simulation, and SPICE simulations of electrical designs. Verification and debugging of prototype systems. Hand soldering and reworking skills. Prototype assembly, including BGA soldering.
- **FPGA development:** VHDL programming and experience with multiple high-end FPGAs. Design development, verification, debugging and optimisation. Experience with embedded soft CPUs, SoCs and custom IP development. OS implementation such as Linux and application software development, interfacing to custom IPs.
- **Embedded systems:** Programming of embedded systems in FPGAs, MCUs and SoCs. From small standalone application in MCUs to complete OS and RTOS implementation in FPGAs and SoCs.
- **Instrumentation:** Experience with high-end instruments from major manufacturer, such as oscilloscopes, logic-analysers, pattern-generators and spectrum analysers.
- **Programming:** Programming skills in C/C++ with deeper understanding of the underlying computer architecture. Understanding the hardware is essential for software performance optimization. Some experience with parallel programming on GPUs with NVIDIA's CUDA.
- **Scientific programming:** Programming skills with Matlab and Octave, for scientific calculations and simulations. Some experience with COMSOL MultiPhysics for simulation of physical systems.
- **Computer knowledge and administration:** Extensive experience of computer systems.

Knows both Windows and Linux. System administration skills with centralised computer systems. Creation and administration of Linux systems with LDAP authentication, NFS shares, SAMBA shares, SAMBA PDC (Windows Primary Domain Controller system), CUPS, SQL database, Apache web server, system virtualization, computer security and backup systems.

- **Research:** Worked on large international research projects, such as the LHC at CERN, the European XFEL at DESY in Hamburg, Germany, and IceCube at the South Pole.

Large research projects:

2002 – 2007	LHC – ATLAS: Worked on the 1 st level trigger of the calorimeter system of the ATLAS detector at the Large Hadron Collider experiment at CERN. My task was to develop the jet finding algorithm and to implement it in an FPGA, which would analyse data from 40 million collision per second in real-time and with low latency. It involved VHDL development, design optimization and verification. Several verification software have been written for verification, both on external computers and inside the FPGA on a CPU in real-time.
2007 – 2015	European XFEL Timing system: This was a collaboration between Stockholm University and DESY. My task was to develop the hardware of the timing and control distribution system, for the accelerator of the European X-Ray Free Electron Laser experiment. This involved several prototype systems, with complete PCB design, verification and debugging. The system was based on FPGAs for which I made significant firmware development for the prototype system, and also wrote several test software which were essential during development. The timing system is made for micro-TCA crate systems, with the MTCA.4 standard, which is a telecom standard with new extensions for physics experiment. The final product consist of a main AMC board, with optional transmitter module, and several RTMs (Rear-Transition Modules). The product has been commercialised and is already being used in large quantities at DESY.

Other research projects and system development:

2016 – 2018	High-speed DAQ: A data acquisition system based on a multichannel high-speed ADC and a Spartan-6 FPGA with USB-3.0 (SS) communication interface. I developed the whole system, including PCB design, FPGA design and wrote the software, plus assembled the prototypes.
2018 – 2020	32-channel Time-to-Digital Converter and Coincidence Detector: A TDC and coincidence detector system with many channels, used in quantum information and communication research. The system is based on an Artix-7 FPGA, with PCIe and USB-3.0 (SS) interface for communication. I developed the whole system, including PCB design, FPGA design and wrote the software.
2018 – present	Camera and motor controller system: A multi-board system based on Renesas Synergy MCUs, with ThreadX RTOS, that controls a USB

	based camera, illumination and stepper motors, used at the research experiment IceCube at the south-pole. I developed the whole electronics system, including PCB design, wrote the MCU software and host computer software to the API level, plus assembled the prototypes.
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Employments:

2015 – Present	1 st Research Engineer at Stockholm University – Physics Dept.
2007 – 2015	Research Engineer and Researcher at Stockholm University – Physics Dept.
2002 – 2007	Ph.D. Student at Stockholm University – Physics Dept.
Summer work 1996, 1997, 1998	Electrician working with low voltage and currents, computer networks and phone systems.

References:

Ph.D. dissertation: <http://su.diva-portal.org/smash/record.jsf?pid=diva2:457982>
Contains even more references.