Andreas Alexopoulos

Software engineer, Data scientist

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Education

PhD in Computer Science
University of Thessaly, Lamia
Thesis: *"Real time beam profile measurements with the Beam Gas Vertex Monitor"*

Diploma (MSc) in Computer & Communication Engineering
Thesis: *"Cryogenic Semiconductor Detectors: Simulation of Signal Formation & Irradiation Beam Test"*
ECTS obtained: *300*
Final Grade: *7.32/10*

Technical Skills

Languages

Python
C/C++, R, Matlab/Octave, Bash
HTML/CSS, Javascript
Java, MIPS Assembly

Frameworks & Libraries

Qt, Numpy, Scipy, Pandas, PyTables, ROOT
Hadoop, Spark, Boost
GSL, OpenCV, OpenGL
Vue.js, Jekyll

Tools

Git, SVN, Atlassian stack, Wireshark, Valgrind suite, Docker

Protocols

TCP/IP, UDP, SSH, USB, GPIB, VMEbus

Operating Systems & IDEs

Linux (10+yr), Windows
Visual Studio Code, Eclipse, JetBrains IDEs, Atom

Experience

Doctoral Student, *CERN* Dec 2015-present
Computing, Detector Physics *Geneva, Switzerland*
· Design of real time data acquisition schemes
· Simulation & tracking of beam-gas interactions for beam profile measurements
· Algorithms for real-time data filtering in a CPU farm based high level trigger
· Communication schemes for hardware control and monitoring
· Data analysis, event reconstruction & visualization

Technical Student, *CERN* Apr 2014-Jun 2015
Computing, Detector Physics *Geneva, Switzerland*
· Simulation of signal formation in semiconductor devices
· Design of a data acquisition system over the network
· Participation in test beams for irradiation tests
· Data analysis & reconstruction of the tests

Intern, *Velti Center of Innovation* Jul-Aug 2009
Software Development *Marousi, Greece*
· Development of GUIs using Java Swing and Web forms

Courses & Seminars

Machine Learning *Apr. 2019*
Stanford University, Coursera, online course

CERN Thematic School of Computing *Jun. 2018*
University of Split, CERN, Mediterranean Institute For Life Sciences

Introduction to Apache Hadoop & Spark *Apr. 2017*
CERN Training

Joint Universities Accelerators School *Feb. 2017*
Beam Instrumentation Courses

CERN Accelerators School *Feb. 2017*
Basics of Accelerator Science and Technology at CERN

R Course *Oct. 2016*
Datacamp, online course

CERN School of Computing *Aug. 2016*
Vrije Universiteit Brussel, CERN, SCK-CEN Academy
ECTS obtained: *6*

Python Hands-on Introduction *Sep. 2014*
CERN Training

Introduction to Computer Science & Programming *Feb. 2014*
MITx, online course

Personal Skills

Languages

English	Level: Proficient
French	Level: Very Good
Spanish	Level: Very Good
Greek	Native Language

Music Skills

Piano	Classes (1993-2003)
Guitar	Classes (1999-2002)
Music Theory	Superior Degree Grade: $(9.7/10)$

Interests

Outreach	Official CERN Guide
Sports	Football, Tennis, Squash, Cycling, Snowboarding
Music	Composer & band member

Selected Publications

"Noninvasive LHC transverse beam size measurement using inelastic beam–gas interactions", A. Alexopoulos et al. (The BGV Collaboration), Phys. Rev. Accel. Beams 22, 042801

First LHC transverse beam size measurements with the beam gas vertex detector, A Alexopoulos et al 2017 Journal of Physics: Conference Series, 874 012086

Development of silicon detectors for Beam Loss Monitoring at HL-LHC, E. Verbitskaya et al 2017 Journal of Instrumentation, Vol.12 C03036

"CERN-RD39 collaboration activities aimed at cryogenic silicon detector application in High-Luminosity Large Hadron Collider", Z. Li *et al*, Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Elsevier, 2015

"Beam Loss Monitors for the Cryogenic LHC Magnets", M. R. Bartosik *et al*, Proc. Int. Beam Instrumentation Conf. (IBIC15), Melbourne, Australia, 2015

Talks

CERN Conference at National Technical University of Athens *Jan. 2018*
Athens, Greece
Presentation Title: "Beam Loss Monitors for the LHC"

8th International Particle Accelerators Conference *Oct. 2017*
Copenhagen, Denmark
Presentation Title: "First Transverse Beam Size Measurements with the Beam Gas Vertex Detector"

CERN Conference at University of Thessaly *Nov. 2016*
Volos, Greece
Presentation Title: CERN and prospects for the students of the ECE Department

Selected Projects

"flask-vue", a single page application with a Vue.js frontend and a Flask backend built primarily for publishing graphs of analyzed data (D3.js, Plotly) (CERN, 2019).

"apidpy", A package for developing model-view-controller (MVC) structured GUIs for data acquisition, analysis & visualization based on Python and PyQt (CERN, 2018).

"bgv-collector", A server running on the control node of a CPU farm, collecting the processing results from the nodes and applied the IPC method for the beam size determination. Implemented with C++, Boost and ROOT (CERN, 2018).

"bgv-display", A graphical application for interactive 3D visualization, data processing and simulations of events from the Beam Gas Vertex detector (CERN, 2018).

"srv-pub-ctrl", A package used to deploy servers/publishers on VME CPUs based on configuration files for hardware control and data publishing (CERN, 2018).

"bgv-l0", A graphical client application controlling the L0 trigger VME boards of the Beam Gas Vertex Detector while retrieving and visualizing the data in real time (CERN, 2017).

"bgv-ipc-sim", An application simulating the potential of the Impact Parameter Correlation (IPC) method for beam size measurements (CERN, 2016).

"bledpy", a graphical client application controlling & acquiring data from the BLEDP stand-alone DAQ system (up to 16MBps) with offline display and data processing functionality used for data acquisition & processing during beam tests (CERN, 2015).

"circuit-simulation", a circuit simulation program (SPICE) implemented in C with GSL. It involved the initial definitions of the equations used for linear and non-linear circuits, their DC and AC analysis while also sparse matrices for the simulation of large netlists (UTH, 2013) .