eduardzorita

scientist, electrical/electronics & software engineer, bioinformatician

contact

Eduard Valera Zorita

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languages

catalan
spanish
english

programming

C & C++
python, Java
Matlab, R
PHP, django, SQL
HTML, CSS
shell scripting
VHDL
LaTeX, git
AGILE

skills

computer science
algorithm design
machine learning
parallel computing
automated testing
databases
electrical eng
signal processing
networks
microprocessors/FPGA
PCB design
microelectronics
control systems
biology
bioinformatics
genomics
molecular biology
math
physics
statistics

projects

starcode
horari sunion

interests

professional: science, creativity, algorithms, big data, biology **personal:** learning, teaching, music, hiking, photography, circus arts, literature, theater, sports and popular culture.

education

2012–2013 **Research Scholar** — Massachusetts Institute of Technology, Cambridge (MA)
I was enrolled at the Department of Mechanical Engineering, where I conducted research on autonomous underwater vehicles and underwater wireless communications.

2011–2012 **MSc Thesis in Electrical Engineering** — Northeastern University, Boston (MA)
Master's Thesis at the Digital Signal Processing laboratory under the supervision of Milica Stojanovic: Underwater communications.
The study was also supported by the Massachusetts Institute of Technology.
Thesis.

2011–2014 **MSc Electronics Engineering** — Universitat Politecnica de Catalunya, Barcelona
Main subjects: semiconductor physics, electronic and photonic devices, microelectronic layer design, FPGA/microcontroller systems design, feedback control circuits.
Thesis.

2006–2011 **BSc & MSc Electrical Engineering** — Universitat Politecnica de Catalunya, Barcelona
Main subjects: math, statistics/probability, physics, circuit theory, electronics, programming, computer architecture, communication theory, information science, antennas, networks, optical communications, advanced signal processing, machine learning, criptography and digital security, quantum computing.

2008–2011 **BSc Physics** — Universitat de Barcelona
Degree not completed, 3 years out of 4 finished.
Main subjects: math, mechanics, electromagnetism, thermodynamics, optics, quantum physics, relativity, particle physics.

experience

Science & Engineering

2014–Now **Centre for Genomic Regulation (CRG)** — Barcelona
Research Scientist/Bioinformatician
Research scientist at the Genome Architecture laboratory (Guillaume Filion). At the lab I work on algorithmically complex problems derived from experimental data analyses, such as sequence clustering, sequence alignment and pattern matching. I also analyze bioinformatic data and contribute to the design of molecular biology experiments.
Research fields: computer science, computational biology, genomics and molecular biology.
Research projects: HIV latency, genome alignment and assembly, DNA sequence clustering.
Lab website.

2013–2014 **Applied Ocean Systems** San Diego, CA

Electrical Engineer

Remotely worked on a small company determined to launch the first underwater wireless communication device capable of transmitting live video stream.

Main responsibilities:

- Design of cutting-edge communication/modulation technology.
- Algorithms for signal synchronization & Doppler compensation.

2012–2013 **AUV Lab @ Massachusetts Institute of Technology** Cambridge, MA

Research Engineer

I worked as communications and electrical engineer at the Autonomous Underwater Vehicles laboratory. Our research lab was comprised of three engineers and our goal was to design and manufacture unmanned and remotely-controlled underwater vehicles for diverse scientific missions.

Main responsibilities:

- Onboard hardware and software design for autonomous underwater vehicles.
- Design of communication technologies for underwater vehicles.
- Design of autopilot and sensor drivers for an autonomous vehicle.

Department website.

2009–2010 **Signal Theory & Communications department @ UPC** Barcelona

Research assistant

I worked as research assistant under the supervision of Prof. Josep Vidal. Our line of research focused on communication techniques for the 4G wireless standard.

Research topics: wireless communications, signal processing, algebra, antenna array processing (MIMO).

2009–2011 **Sunion ICC** Barcelona

Software Developer

I developed a platform to provide digital support to a dynamic class schedule system. The project was specially developed for a secondary school based in Barcelona. The platform has a desktop editor software, database server, screen visualization system and mobile/web app.

Web/mobile app.

Teaching

2015–2016 **School of Molecular and Theoretical Biology** Pushchino, Russia/Barcelona

Faculty

I participated as faculty in two editions of the School of Theoretical and Molecular biology held in Pushchino, Russia and Barcelona on August 2015/2016, respectively.

Projects taught:

Laboratory of DNA manipulation. The students learned how to clone specific DNA sequences from major Eukaryote species in a real laboratory project. They further analyzed and presented the obtained results following the scientific method.

Laboratory of Yeast transformation. The students learned how to make genetically modified yeast in a real laboratory project. They further analyzed and presented the obtained results following the scientific method.

Skills taught:

- Molecular biology.
- Basic microbiology.
- Basic bioinformatics.
- DNA cloning.
- Yeast culture and growth.

2015 **Bioinformatics, Laboratory Course** Universitat Pompeu Fabra, Barcelona
Human Biology degree
I taught a laboratory project on basic bioinformatics. The students had to use basic bioinformatic tools and programming knowledge to identify selenoproteins through sequence analysis and protein structure prediction.

2010–2011 **Physics, Course I** Universitat Politecnica de Catalunya, Barcelona
Electrical Engineering degree
I taught an undergraduate course on Physics. Teaching evaluation awards: Most attended course and best attendee performance.

volunteering

2013–2015 **ALS palliative care** Fundacio Miquel Valls, Barcelona
I provided weekly palliative care to patients with Amyotrophic Lateral Sclerosis, a fatal motor neuron disease.

2011 **Education through sport** Uvikiuta Organization, Tanzania, Africa
We used sports and games to assist education and cultural exchange with primary school kids in Dar es Salaam, Tanzania.

publications

Journal articles

A new quinoline BRD4 inhibitor targets a distinct latent HIV-1 reservoir for re-activation from other 'shock' drugs
Erik Abner, Mateusz Stoszko, Lei Zeng, Heng-Chang Chen, Andrea Izquierdo-Bouldstridge, Tsuyoshi Konuma, Eduard Zorita, Elisa Fanunza, Qiang Zhang, Tokameh Mahmoudi, Ming-Ming Zhou, Guillaume J. Filion, and Albert Jordan
Journal of Virology *(2018). 2018*

Using Barcoded HIV Ensembles (B-HIVE) for Single Provirus Transcriptomics
Chen Heng-Chang, Zorita Eduard, and Filion Guillaume J.
Current Protocols in Molecular Biology *122.1 (2018) e56. 2018*

Position effects influence HIV latency reversal
Heng-Chang Chen, Javier P. Martinez, Eduard Zorita, Andreas Meyerhans, and Guillaume J. Filion
Nature Structural & Molecular Biology *24.1 (Jan. 2017) pp. 47–54. Nature Publishing Group, 2017*

Space-Frequency Block Coding for Underwater Acoustic Communications
E. Zorita and M. Stojanovic
IEEE Journal of Oceanic Engineering *40.2 (Apr. 2015) pp. 303–314. 2015*

Starcode: sequence clustering based on all-pairs search
Eduard Zorita, Pol Cuscó, and Guillaume J. Filion
Bioinformatics *31.12 (2015) pp. 1913–1919. 2015*

Conference papers

Space-frequency coded OFDM for underwater acoustic communications
E. Zorita and M. Stojanovic
2012 Oceans, 2012

Network MIMO for downlink in-band relay transmissions with relaying phases of fixed duration
A. Agustin, J. Vidal, S. Lagen, and E. Zorita
2011 19th European Signal Processing Conference, 2011

Network-MIMO backhauling for QOS-constrained relay transmission
J. Vidal, A. Agustín, S. Lagén, E. Zorita, O. Muñoz, A. Garcia Armada, and M. S. Fernández

2011 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2011