Filippo Broggini

Tel: +41(0)787955564
Email: filippo.broggini@gmail.com
LinkedIn: filippobroggini
Website: filippo82.github.io

Highly motivated and experienced computational geophysicist looking to apply skills in a technology leadership role

Career history

Senior Scientist - ETH Zürich, Zürich, Switzerland
Research, education, supervision, open-source software

01.2017 - present

- Lead the development (porting to GPU) and optimization (speed-up) of a C++ seismic wave propagation modelling software and various Python packages for research and teaching purposes
- Lead and supervised a team of PhD (3) and MSc students (2)
- Awarded multiple grants from the Swiss National Supercomputing Centre (CSCS) for the development of high-performance computing (HPC) applications (500K node hours)

Postdoc - ETH Zürich, Zürich, Switzerland
Research, education, supervision, open-source software

09.2013 - 12.2016

- Developed new applications to tackle long-standing problems in subsurface imaging and published the findings in peer-reviewed journals and conference proceedings
- Lead and supervised a team of PhD (2) and MSc students (4)
- Wrote a successful PhD project proposal funded by multinational energy company (budget of €300.000)

Geophysicist Summer Intern - Schlumberger Cambridge Research, Cambridge, UK

Summer 2010 and 2011

- Planned novel physical experiments and developed software (MATLAB) to analyze and process the acquired data which resulted in a patented algorithm

Scientific Software Developer - Università di Pisa, Pisa, Italy

10.2007 - 07.2008

- Optimization of software for the simulation of seismic wave propagation which resulted in a 20x speed-up

Education

PhD, Exploration Geophysics - Colorado School of Mines, CO, USA
Exploration geophysics, data processing, high-performance computing (HPC), outreach

08.2008 - 05.2013

- **Research:** Developed a novel and innovative geophysical method, *Marchenko focusing*, now used and further investigated by many international research groups (TU Delft, Utrecht University, University of Edinburgh, KAUST, NTNU) and energy companies (such as Shell, Saudi Aramco, Schlumberger, Petrobras, Equinor)
- **Thesis:** Wave Field Autofocusing And Applications To Multidimensional Deconvolution And Imaging With Internal Multiples - Winner of the **Gustavo Sclocchi Theses Award** presented by EAGE, Assomineraria, and SPE Italy

MSc, Exploration and Applied Geophysics - Università degli Studi di Milano, Milan, Italy
Exploration geophysics, data processing

09.2004 - 09.2007

- **Research:** Focus on theoretical geophysics, data processing, and computing
- **Thesis:** Seismic waves propagation modeling by reflectivity method - **Awarded 110 out of 110** *cum laude*

BSc, Telecommunications Engineering - Politecnico di Milano, Milan, Italy
Signal processing, telecommunications network

Summer 2010 and 2011

- **Thesis:** MATLAB scripts for Ground Penetrating Radar

Key Skills

Computing

- Languages: C++, Python, MATLAB, C
- ML/DL: scikit-learn, fast.ai/pytorch, Keras/TF
- DevOps: git, Docker
- HPC: Numba, OpenACC, CUDA,OpenMP, MPI

Teamwork

- Established scientific cooperation with international teams which resulted in peer-reviewed publications and contributed to a successful EU-funded project involving 15 academic and industry partners (WAVES project, budget of €3.200.000)
- Motivating, quick-learning, and mentoring skills allowed me to find like-minded team members to compete and win a prize in a hackathon on machine learning and visualization applying computer vision techniques (OpenCV) and developing a web application for exploring geoscience data (scikit-learn, Dash) in two days

Leadership

- Chairman of the EAGE Young Professional group (2014 to 2018)
- Member of the EAGE Education Committee: pushed for the introduction of the first Data Science courses in the course catalogue
- Organized multiple successful workshops and hackathons on reproducible science, visualization, and machine learning attended by 50 participants each

Communication

- Experienced in clearly communicating results and ideas: authored 20 peer-reviewed scientific publications and speakon at multiple international conferences
- Introduced innovative techniques in teaching BSc and MSc courses: top-down approach, flipped classroom, Jupyter Notebooks
- Open-source software advocate with active engagement in the SoftwareUnderground community

Drive

- At the Institute of Geophysics at ETH Zürich, I pushed for the modernization of the BSc programme with the introduction of mandatory courses on data analysis and visualization with Python, and good practices in research (reproducibility, version control, ethics)

Courses and certifications

- Machine Learning from Coursera
- High-Throughput LabVIEW FPGA/FlexRIO; LabVIEW Core 1; LabVIEW FPGA

Language Skills

- Italian   Native
- English   Fluent
- German   Colloquial (B2)