

Federico M. Barabas

POSTDOCTORAL RESEARCHER

Stockholm, Sweden

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Profile

- Wrote a software that enabled large-scale image data analysis of biological structures. It allowed researchers to discover new mechanisms in the degeneration of neurons.
- Developed an original control and automation software for microscopy in Python currently in use at two research labs. Being open-source, it saves thousands of dollars in license fees and can be adapted to perform custom experiments.

Skills

Programming

Python for statistical data analysis (numpy, pandas, scikit-learn) and visualization (matplotlib, seaborn, PyQt), C++, Linux, Git, LaTeX.

Statistics

Correlation analysis, significance, parameter estimation, hypothesis testing, supervised and unsupervised learning.

Optics

Microscopy system design, construction and automation. Biological imaging at nanometric resolution.

Experience

Advanced Optical Bio-Imaging Lab, SciLifeLab

Stockholm, Sweden

POSTDOC RESEARCHER

2017 - PRESENT

- Building a next-generation microscope capable of imaging biological structures with unprecedented detail.
 - Design of optical illumination and detection layout and concept.
 - Image and numerical data analysis and visualization
 - Programming of the device integration and automation.
 - Advising and teaching of Master students.

Applied NanoPhysics Group, Bionanosciences Research Center

Buenos Aires, Argentina

PHD CANDIDATE

2012 - 2017

- Designed and built a state-of-the-art microscope capable of acquiring images of biological samples with nanometric resolution.
 - Open-source modular integral control software description published in REVIEW OF SCIENTIFIC INSTRUMENTS (2016).
 - Code repository: github.com/fedebarabas/tormenta.
- Headed the development of an analysis tool to automatically quantify the presence of periodical structures in bioimaging.
 - The tool description was published in SCIENTIFIC REPORTS (2017).
 - Code repository: github.com/fedebarabas/ringfinder.
 - It enabled the community to understand mechanisms of neuron degeneration, as published in SCIENTIFIC REPORTS (2018).

Dept. of NanoBiophotonics, Max Planck Institute for Biophysical Chemistry

Göttingen, Germany

PHD CANDIDATE INTERNSHIP

2013

- Trained in optical microscopy at high resolutions at the laboratory of Nobel laureate Dr. Stefan Hell.

Detection Technologies and Astroparticles Institute

Buenos Aires, Argentina

LICENCIATE THESIS

2011 - 2012

- Determined the statistical counting efficiency of particle detectors for the upgrading of the Pierre Auger Observatory.

Education

Buenos Aires University

Buenos Aires, Argentina

PHD IN PHYSICAL SCIENCES

2012 - 2017

Buenos Aires University

Buenos Aires, Argentina

LICENCIATE IN PHYSICAL SCIENCES

2006 - 2012

Courses

Stanford University

MACHINE LEARNING COURSE

www.coursera.org

Nov 2017 - Jan 2018

Teaching

Physics Dept., Faculty of Exact and Natural Sciences, Buenos Aires University

GRADUATED ADVANCED LABORATORY TEACHING ASSISTANT

[Buenos Aires, Argentina](#)

2015 - 2017

Science and Technology School, San Martín National University

GRADUATED TEACHING ASSISTANT

[Buenos Aires, Argentina](#)

2012 - 2013

Management

Optical Society of America Student Chapter

PRESIDENT

[Buenos Aires University](#)

2015 - 2017

- Doubled the number of active members through the organization of recruitment activities.
- Wrote winning grant applications that led to a 50% growth in the Chapter resources.
- Launched a new activity where young researchers presented their work to spark collaborations and inspire students into optics.

Additional information

Languages Spanish (native), English (fluent), Swedish (basic), Italian (basic).

Tech interests Machine learning, deep learning, artificial intelligence, open source projects, open data, open hardware, data visualization, data journalism.

Other interests bike fixing and touring, space and astronomy, reddit, Seinfeld, Simcity.