

Michalis Vrettas - Ph.D.

Keywords: Machine Learning, Artificial Neural Networks, Regression/Classification, Stochastic Processes, Optimizations, Data Science, Mathematical Modeling, Bayesian Inference, Python3, C++11.

[Professional Experience]

- 2020 – today **Postdoctoral Researcher**, *University of Naples – Federico II*, Naples, Italy.
I am currently a post-doctoral researcher at the department of Pharmacy focusing on the development of **machine learning** and **artificial intelligence** methods using Nuclear Magnetic Resonance (NMR) data.
- 2017 – 2020 **Data Scientist**, *Central Laser Facility – STFC*, Harwell, UK.
The main focus in this role was on developing and applying **computational methods** in C++11 and PYTHON3 (using numpy, scipy, matplotlib, pandas), to maximize the scientific potential of **single molecule microscopy** data, to enable scaling up the analysis process and translating it from lab to the clinic.
- 2013 – 2017 **Ed Lorenz Postdoctoral Scholar & Associate Specialist**, *U. C. Berkeley*, California, USA.
Scientific research and implementation of algorithms, of novel **mathematical models** (numerical solvers of **Partial Differential Equations**), in groundwater hydrology with major applications in global climate models. My work focused on designing a new stochastic conductivity model that better describes deep subsurface groundwater dynamics, with primary applications in the area of hydro-geology.
- 2011 – 2013 **Postdoctoral Research Fellow**, *Aston University*, Birmingham, UK.
Worked on a European Union (EU)-funded project on **remote sensing classification** uncertainty. Part of my role was to build a range of different probabilistic classifiers and train them on real satellite images of flooded areas, to assist decision-making in environmental policies.
- 2010 – 2011 **Postdoctoral Research Fellow**, *University of Nottingham*, Nottingham, UK.
Developed statistical methodologies (**Monte Carlo EM**) for quantifying computer simulation discrepancy, with an application to a conceptual rainfall-runoff hydrological model.

[Education]

- 2006 – 2010 **Ph.D. Bayesian Data Assimilation**, *Aston University*, Birmingham, UK.
Thesis: *Approximate Bayesian techniques for inference in stochastic dynamical systems*
- 2000 – 2004 **B.Sc. Information Engineering**, *A.T.E.I. of Thessaloniki*, Greece.
Thesis: *Automated exam timetables: optimization with parallel evolutionary algorithms*

[Professional Training]

- July 2017 **CUDA Programming on NVIDIA GPUs**, *Oxford University*, UK.
- May 2012 **Advanced Data Assimilation for Geo-sciences**, *Ecole De Physique*, France.
- Aug. 2008 **Earth System Monitoring and Modeling**, *ESA-ESRIN*, Italy.
- Sep. 2008 **Mathematics for Data Modeling**, *University of Sheffield*, UK.
- Sep. 2006 **Pattern Analysis for Neural Networks**, *Aston University*, UK.

[Skills]

- Computational Machine learning, Bayesian analysis, data assimilation, optimization and AI algorithms
- Programming PYTHON (8+ years), MATLAB (6+ years), C++(3+ years), JAVA (2+ years)
- Opr. Systems Linux (Ubuntu), macOS, Windows – (user level)
- Other LATEX, OMP, CUDA (Thrust), ImageJ (Fiji)

[Languages]

- Greek Mother tongue
- Italian Beginner (actively learning)
- English Full professional proficiency