

Guillem HURAULT | Engineer

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Engineer and PhD candidate in statistical Machine Learning applied to eczema. Hands-on experience in managing research projects Additional background in Economics.

Education

- 2018–Today **PhD in Biomedical Engineering**, *Department of Bioengineering, Imperial College London, UK*.
Development of machine learning and mathematical models to predict eczema. Supervisor: Dr. Tanaka.
- 2016–2017 **MSc in Biomedical Engineering, Neurotechnology**, *Imperial College London, UK*, Distinction.
- 2014–2018 **Master's Degree in Engineering**, *Ecole Centrale de Lyon*, one of FRANCE's top engineering school.
- 2014–2016 **Bachelor's Degree in Economics**, *Université Lyon 2, FRANCE*.
- 2012–2014 Intensive preparation in Maths and Physics for the highly competitive entrance exams to the French "Grandes Écoles" at *Lycée Chateaubriand, Rennes (FRANCE)*.

Professional Experience




- October 2017 **Research Assistant**, *Department of Bioengineering, Imperial College London, UK*.
– Today – Developed statistical machine learning models of eczema for personalised medicine, with a particular focus on: multilevel Bayesian models, regularised regressions, time-series analysis, model-based clustering, computer vision.
– Performed literature reviews, designed visualisations, communicated results in comprehensive reports, scientific articles and during conferences.
– Co-supervised student projects, organised group meetings, conducted interviews, maintained the group's website.
- 2019 – Today **Teaching Assistant**, *Department of Bioengineering, Imperial College London, UK*.
– Probability & Statistics
– Mathematics
– Occasional teaching: Machine Learning, Brain Machine Interfaces.
- May-July 2016 **Research Intern**, *Laboratoire de Neurosciences Cognitives (CNRS UMR 7291, Aix-Marseille Université)*.
Analysed fMRI images using Machine Learning to understand the role of the oculomotor cortex in social perception.
- Casual Work Manual work in an automated mail centre (4 weeks in July 2015), Tutoring in Maths and Physics to high school students (2012–2014), Archiving in a law office (one week during summer 2012 and 2013).

Other Experiences

- 2019 – Today **Bioengineering PhD representative**, *Imperial College London*.
Represented students in departmental meetings, organised social events.
- 2014–2017 **Engineering student**.
– Investigated the evolution of eczema using Machine Learning methods in the Biological Control Systems Lab.
– Designed a genetic algorithm in a research project with LIRIS Lab (CNRS) to solve a scheduling problem.
– Supervised a 6-person team for HEXADRONE to design and test a security system to avoid the crash of a drone.
- 2015 **General Secretary**, *Forum Perspectives*.
Organized a yearly career fair with 100 companies, 2000 students participating and a turnover of 250k€.
- 2015 **Treasurer, Communication coordinator and Editor** of Centrale Lyon's newspaper Piston Hebdo.
- 2015 Active committee member of Centrale Lyon's Cinema Society.
- 2013 International Workcamp in Biscay, SPAIN. Renovated an hermitage related to the Spanish Civil War.

Skills

Languages ◦ Native **French** ◦ Fluent **English** ◦ Notions in Portuguese, Italian and Spanish

Programming **Working knowledge:**  R (incl. tidyverse, Shiny),  Stan,  MATLAB (incl. SPM), \LaTeX .

Basic knowledge: Python, SQL, C# (incl. Infer.NET), Mathematica, HTML, Tableau, JavaScript, C++.

Software Microsoft Office (incl. Publisher), GitHub, Microsoft Visual Studio, Adobe Premiere, Gimp.

Publications & Preprints

- [1] **G. Hurault**, E. Domínguez-Hüttinger, S. M. Langan, H. C. Williams and R. J. Tanaka, "Personalised prediction of daily eczema severity scores using a mechanistic machine learning model", *MedRxiv*, 2020.
- [2] J. Noursbeck, M. McAleer, **G. Hurault**, E. Kenny, K. Harte, S. Kezic, R. Tanaka and A. Irvine, "miRNA analysis of Childhood Atopic Dermatitis reveals a role for miR-451a" *British Journal of Dermatology*, 2020.
- [3] M. McAleer, I. Jakasa, **G. Hurault**, P. Sarvari, I. McLean, R. Tanaka, S. Kezic and A. Irvine, "Systemic and stratum corneum biomarkers of severity in infant AD include markers of innate and Th-related immunity and angiogenesis", *British Journal of Dermatology*, vol. 180, no. 3, pp. 586–596, 2019.
- [4] **G. Hurault**, M. Schram, E. Roekevisch, P. Spuls and R. Tanaka, "Relationship and probabilistic stratification of EASI and oSCORAD severity scores for atopic dermatitis", *British Journal of Dermatology*, vol. 179, no. 4, pp. 1003-1005, 2018.

Talks & Posters

- [1] "A Bayesian Hidden Markov model to predict the dynamic evolution of disease severity in eczema", poster presented at the International Conference on Systems Biology of Human Diseases, 2019
- [2] "Bayesian Modelling to Predict the Evolution of Eczema Severity", poster presented at the International Conference on Systems Biology, 2018.
- [3] "Bayesian Machine Learning to Predict Short-term Course of Eczema Severity", presented at BioMedEng18, 2018
- [4] "Predicting short- and long-term outcomes of a systemic therapy for atopic dermatitis using machine learning methods", presented at the International Symposium on Atopic Dermatitis, 2018
- [5] "How can Machine Learning help our understanding of Atopic Dermatitis?", presented at the London Skin Club, 2017