

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: Bayesian modelling, time-series, regularisation, clustering, computer vision.
 - Developed software packages, applied reproducible research practices, participated in collaborative projects, performed literature reviews, designed visualisations.
 - Communicated results in comprehensive reports, scientific articles and during conferences.
 - Co-supervised 25+ student projects, organised group meetings, conducted interviews, maintained the group's website.
- 2019 – 2021 **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 – 2021 **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.

Skills

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

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

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**, V. Delorieux, Y-M. Kim, K. Ahn, H. Williams and R. J. Tanaka, "Impact of environmental factors in predicting daily severity scores of atopic dermatitis", *Clinical and Translational Allergy*, vol. 11, no. 2, 2021.
- [2] J. G. Holm, **G. Hurault**, T. Agner, M.L. Clausen, S. Kezic, R. J. Tanaka, S. F. Thomsen, "Immunoinflammatory Biomarkers in Serum Are Associated with Disease Severity in Atopic Dermatitis", *Dermatology*, 2021.
- [3] R. Jurakic Tonic, I. Jakasa, Y. Sun, **G. Hurault**, S. Ljubojevic Hadzavdic, R. J. Tanaka, S. Kezic and B. Marinovic, "Stratum corneum markers of innate and T helper cell-related immunity and their relation to the disease severity in Croatian patients with atopic dermatitis", *Journal of the European Academy of Dermatology & Venereology*, 2021.
- [4] **G. Hurault**, E. Roekevisch, M.E. Schram, K. Szegedi, S. Kezic, M.A. Middelkamp-Hup, P.I. Spuls and R. J. Tanaka, "Can serum biomarkers predict the outcome of systemic therapy for atopic dermatitis?", *MedRxiv (preprint)*, 2020.
- [5] K. Pan, **G. Hurault**, K. Arulkumaran, H. Williams and R. J. Tanaka, "EczemaNet: Automating Detection and Assessment of Atopic Dermatitis", *International Workshop on Machine Learning in Medical Imaging*, 2020.
- [6] **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", *Clinical & Experimental Allergy*, vol. 50, no. 11, pp. 1258–1266, 2020.
- [7] J. Noursbeck, M.A. McAleer, **G. Hurault**, E. Kenny, K. Harte, S. Kezic, R.J. Tanaka and A.D. Irvine, "miRNA analysis of Childhood Atopic Dermatitis reveals a role for miR-451a" *British Journal of Dermatology*, 2020.
- [8] M.A. McAleer, I. Jakasa, **G. Hurault**, P. Sarvari, W.H.I. McLean, R.J. Tanaka, S. Kezic and A.D. 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.
- [9] **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] "Computational tools for data-driven personalised medicine for Atopic Dermatitis", poster presented at the International Symposium on Atopic Dermatitis, 2021
- [2] "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
- [3] "Bayesian Modelling to Predict the Evolution of Eczema Severity", poster presented at the International Conference on Systems Biology, 2018.
- [4] "Bayesian Machine Learning to Predict Short-term Course of Eczema Severity", presented at BioMedEng18, 2018
- [5] "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
- [6] "How can Machine Learning help our understanding of Atopic Dermatitis?", presented at the London Skin Club, 2017