# Hugo Soulat

hugos@gatsby.ucl.ac.uk

**PROFILE**

I am a PhD student in Computationnal Neuroscience and Machine Learning at Gatsby Unit where I use and develop mathematical and statistical tools to address brain related questions. Before starting my PhD, I obtained two master degrees in systems and bioengineering from École Polytechnique (France) and EPFL (Switzerland) after which I worked 2 years in E.Brown's Neuroscience Statistics Research Laboratory (Harvard/MIT- Boston) as a data analyst and research assistant.

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**EDUCATION**

*Gatsby Computational Neuroscience Unit* , 2019 - now
PhD student under the supervision of Maneesh Sahani.

*Harvard Medical School - MIT* , 2017 - 2018
1 year master project in Neuroscience Statistics and data analysis.

*EPFL (Switzerland)* , 2016 - 2018
Second master degree of science in Systems Bioengineering and Neurobiology GPA 3.8/4

*École Polytechnique (France)* 2013 - 2017
Master degree of science in Biophysics and Mathematics GPA 3.86/4

*Lycée Louis Le Grand, Paris* 2011- 2013
Intensive two-year preparatory course for the competitive entrance exams to top French engineering schools GPA 4/4

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**EXPERIENCE**

*Data Analyst* 2018 - 2019
Neuroscience Statistics Research Laboratory. MIT - HMS, Boston, USA

*Master Project* 2017 - 2018
Neuroscience Statistics Research Laboratory. MIT - HMS, Boston, USA

- Simultaneous EEG- fMRI analysis
- Design Expectation Maximization and Kalman filtering algorithms
- Statistical inference

*Research Internship* March 2016 - August 2016
Unit of Dynamic Neuronal Imaging, Pasteur Institute, Paris, France

- Built a Fluorescence Correlation Spectroscopy microscope from nothing
- Designed and implemented FCS Experiments
- Implemented numerical simulations tools assessing the experiments validity.

*Junior engineer* May 2015 - July 2015
Techno Scientific Inc., Toronto, Ontario, Canada

- Studied and characterized materials for biomedical applications

*Human/military formation (as part of École Polytechnique training)* 2013 - 2014
French Air Force officer training school

- Participated in training missions and drew up internal audit reports..

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**TECHNOLOGY LANGUAGES SKILLS**

*Languages:* English, French.
*Programming Languages:* Python, Matlab, Java, Tex, Processing, Mapple.
*Software:* Microsoft Office, FSL, Comsol Multiphysics, Sketchup, TeXMaker.

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**DISTINCTIONS**

*Bertarelli Fellowship* 2017-2018
Bertarelli Foundation and EPFL annually selects three to five students to perform their master's research in Harvard Medical School (HMS) or HMS-affiliated labs over a ten- to twelve-month period.

*Master Degree Excellence Mention* 2018
Awarded for student whose master studies average exceeds 5.5/6 (GPA>3.7).

*EPFL Excellence Fellowship* 2016
Awarded to students with outstanding academic records.

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**INTERESTS**

World health and politics, scuba diving, basketball, piano, life and basic sciences.

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**PUBLICATIONS**

[1] *State Space Methods for Phase Amplitude Coupling Analysis.* **Soulat, Hugo**, Stephen Emily, Beck Amanda, Purdon, Patrick. (2019) BioArxiv 10.1101/772145.

[2] *Multitaper Infinite Hidden Markov Model for EEG.* Andrew H. Song , Leon Chlon , **Soulat Hugo** , John Tauber , Sandya Subramanian , Demba Ba , Michael J.Prerau. 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Berlin, Germany, 2019, pp. 5803-5807. doi: 10.1109/EMBC.2019.8856817

[3] *Cross-Frequency Coupling Analysis using State Space Oscillator Models*, **Soulat, Hugo**, Stephen Emily, Beck Amanda, Purdon, Patrick. (2019) SAND9 poster