curriculum vitæ of
# Sebastian Partarrieu

Student @ Mines ParisTech specialized in
Applied Mathematics, Data Science and Machine Learning

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## Education

Sep. 2019 – Jul. 2023 **M.Sc. equivalent** specialization in applied mathematics — Mines ParisTech

The cycle ingénieur civil of Mines ParisTech is one of the most prestigious[1] curriculums in France. Students enter after taking nationwide exams ranking them across scientific and literary disciplines.

Major subjects include Mathematics, Physics and Computer Science. Specific modules chosen include Stochastic, Integral and Differential Calculus, Optimization, Intro to Data Science, Deep Learning for Image Analysis, Advanced Data Science, Signals Processing, Operations Research, Databases & Networking, ...

Sep. 2017 – Jul. 2019 **B.Sc. equivalent** Mathematics and Physics — Lycée Privé Sainte-Geneviève

Two year multidisciplinary, intense and competitive curriculum in preparation for nationwide exams ranking France's top students[2].

Major subjects include Mathematics, Physics, Chemistry and Computer Science.

## Research & Work Experience

Mar. 2021 – Aug. 2021 **Visiting Research Intern** — Harvard University

Full-time research position (Jia Liu Group) on using deep learning tools, such as coupled autoencoders, to improve multi-modal analysis of cell types within the brain. The ultimate objective is to build robust characterizations of these cell types and their stereotypical interactions to better understand the brain's computations.

Jul. 2020 – Aug. 2020 **Summer Research Intern** — National Physical Laboratory (NPL)

Research was conducted on applying various deep learning methods such as convolutional neural networks (CNNs) in order to detect different types of cardiovascular disease such as Myocardial Infarction (MI) or Atrial Fibrillation by using raw electrocardiogram (ECG) signals as the input. Fully functional scripts were approved and reviewed by senior researchers.

Nov. 2019 **Data Analyst Intern** — Prüftechnik group | CRC Laboratory Mines ParisTech

Research was conducted on applying predictive maintenance methods to wind farms. A total of five years worth of accelerometer data coming from 5 wind turbines was processed and used to train traditional machine learning techniques (SVM, Random Forest, ...) after performing some feature engineering. Deep learning methods (CNNs and Autoencoders) were implemented on spectrogram images, all of this in python and keras, resulting in final overall accuracy of over 98%.

## Projects & Skills

**Projects**[3] include:

- Developped a mobile application linking small store owners with nearby customers. Front-end was written using React Native and back-end in Python with the help of Flask and other relevant libraries.
- Using style transfer powered by machine learning to create a Virtual Reality (VR) application with Unity plunging the user into the immersive worlds of Van Gogh, Monet, Kirchner and many others...
- Created python modules for E-Cube Gaz Naturel to generate scenarios of spot and forward prices of the French natural gaz market using quantitative finance methods applied to a commodities market before solving the non-linear optimization problem of finding an optimal buying/selling strategy.

**Technical skills:** Advanced knowledge of Python and it's scientific libraries/deep learning frameworks (pandas, scipy, sklearn, tensorflow, keras, pytorch, ...) along with flask. Knowledge of HTML, CSS, JS and React Native, PostgreSQL, Git, LaTeXand C#.

**Linguistic skills:** French (native), English (native - TOEFL 119/120), Spanish (advanced), Chinese (beginner).

## Additional Experience & Activities

Sep. 2020 – Mar. 2021 Lycée Saint-Louis — English Oral Examinator

Evaluated 1st year undergraduate students in English oral examinations that are part of the standard engineering curriculum.

**Activities:** Tennis team of Mines ParisTech, Rowing, Ski, Debating, Philosophy (Reading)

[1] Generally ranked #2 or #3 Grande Ecole d'Ingénieur in France
[2] Ranked #1 Classes Préparatoires aux Grandes Ecoles in France
[3] For a complete overview of the different projects: sebastianpartarrieu.github.io and https://github.com/SebastianPartarrieu