

Axel Peytavin

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RESEARCH INTERESTS

Generative AI; Small, open-source, local LLMs; Human-Computer Interaction (HCI); Computational Social Sciences; Misinformation; Education; Behavioral experiments; Graph Neural Networks; Robotics;

EDUCATION

- **Stanford University** Stanford, CA
M.S. Computational and Mathematical Engineering; GPA: 3.8 Sep 2021 – Jun 2023
Key subjects: Discrete and Stochastic Mathematics, Computational Social Sciences, NLP for Computational Social Sciences, Topics in Social Data, Graph Neural Networks, Meta Learning, Deep Reinforcement Learning, Product Design, Principled Entrepreneurial Decisions
- **CentraleSupélec, Université Paris-Saclay** Paris, France
B.S. Engineering; GPA: 3.9 Sep 2017 – Jun 2019
Key subjects: Stats & Probas, PDEs, Graph Theory, Optimization, HPC/GPU, Quantum Physics, Aircraft Design, System Engineering
- **Lycée Louis Pasteur** Neuilly-sur-Seine, France
Preparatory classes in Maths and Physics; GPA: 4.0 Sep 2015 – Jun 2017
Intensive two-year preparation in theoretical Mathematics and Physics for the highly competitive French Grandes Ecoles entrance exams.

EXPERIENCE

- **Stanford University** Stanford, CA
Research Assistant in MS&E and CEE January 2023 – now
 - **Twitter Community Notes Impact Dataset:** Collected & assembled the world's biggest dataset on Twitter Community Notes during 9 months, gathering 31,000 tweets, using a multi-stage scraping & API wrapper. JIT computed their associated social graphs & features. With MS&E Pr. Johan Ugander & Pr. Martin Saveski. *Analysis is ongoing.*
 - **Building Energy Efficiency Estimation:** Developing the first CV model to estimate energy efficiency for buildings based on public data + outdoor & indoor images. With Ph.D. student Kevin Mayer & CEE Pr Martin Fischer. *Development is ongoing.*
 - **Global Climate Change Stance:** Developed a SOTA classifier for climate change stance in tweets, based on GPT-3.5, w/ 88% accuracy. Analyzed evolution around political events. Best poster award.
- **getalong.io** Stanford, CA
Co-Founder & CEO Jun 2021 – Aug 2023
 - **Anti-polarization commenting platform:** Designed, built and deployed a news article annotation and social analytics platform for news websites using React, Flask, AWS, GPT-4, Llama2.
 - **Tweet polarization scoring:** Using twitter data and graph-based numerical methods such as clustering to compute a polarization score on a tweet without considering text content. Deployed as a Twitter bot to observe user interest. Uses tweepy, networkx, PyG.
 - **Impact:** Deployed on The Stanford Daily & The Salt Lake Tribune, **6.5M+ monthly visitors**, awarded **\$23,500** in funding.
- **The Ocean Cleanup** Rotterdam, The Netherlands
Computational Modeler Mar 2020 – Jul 2021
 - **Data Assimilation:** Developed the first data assimilation procedure for lagrangian dispersion models with MIT EAPS researchers, based on Ensemble Kalman Filtering, achieving **85% accuracy** from a 20% baseline.
 - **GPU Plastic Model:** Published the **first 3D, GPU ocean plastic dispersion model** using OpenCL. Published code with a paper outlining results and accumulation locations underwater. Also used for a **statistical analysis** published in **Scientific Reports** of the origin distribution of plastics in the North Pacific.
 - **Wave-induced drift theory improvement:** Ran **experiments** in basin to **determine empirical relations** on the dispersion of plastics depending on shape and density, with University of Cambridge Researchers.
 - **Interactive Map:** Prototyped and led the development of [The Plastic Tracker](#) to popularize plastic dispersion in our audience. **Featured in conferences.** **+200k users.** FastAPI, numba, React.js, mapbox.
- **CentraleSupélec CubeSat Spatial Center (CS3)** Paris, France
System Engineer Sep 2018 – Jun 2019
 - **Satellite GPU autonomous navigation:** Led a team of 10 students working on thermal, structural and energetic design of a **\$1M year-long CubeSat mission** aiming to use overheating-prone GPUs in space missions for navigation (2018-2019)
- **BAM.Tech** Paris, France
Mobile Developer Aug 2019 – Mar 2020
 - **Large-scale applications:** Developed in a team 3 applications in a team in React Native Typescript.
 - **Professional code:** Used tools such as git, a Jenkins CI/CD, linter, prettier to maintain a team codebase.

TEACHING EXPERIENCE

- **ICME Summer 2023 Big Data Workshop** - Created new workshop content + code case studies from scratch, co-taught 40 students from varying backgrounds & ages. **Rated 2nd best workshop out of 12 this summer**
- **Graduate Software Development (C++ / Python) - Lead TA, Lecturer**, maintained autograder, graded students, ran Office Hours. (Stanford CME 211, Fall 2022/2023)
- **Advanced Graduate Software Development (C++)** - Graded students, ran Office Hours, moderated forum. **Rated 4.26/5 on quality of instruction by students.** (Stanford CME 212, Winter 2021/2022)
- **Principled Entrepreneurial Decisions** - Graded students, led workshops, created new case-study. **Rated Best TA (out of 5 TAs + lecturer)**(Stanford ENGR 248, Winter 2022/2023)

PUBLICATIONS & TALKS

- **Peytavin, A.**, Sainte-Rose, B., Forget, G., & Campin, J.-M. Ocean Plastic assimilator v0.2: Assimilation of plastic concentration data into lagrangian dispersion models. *Geoscientific Model Development*, 2021.
- Klink, D., **Peytavin, A.**, & Lebreton, L. Size dependent transport of floating plastics modeled in the Global Ocean. *Frontiers in Marine Science*, 2022.
- Lebreton, L., Royer, S.-J., **Peytavin, A.**, Strietman, W. J., Smeding-Zuurendonk, I., & Egger, M. Industrialised fishing nations largely contribute to floating plastic pollution in the North Pacific Subtropical Gyre. *Scientific Reports*, 2022.
- Calvert, R., **Peytavin, A.**, Pham, Y., Duhamel, A., van der Zanden, J., van Essen, S., Sainte-Rose, B. & van den Bremer, T.S. The effect of size, density, and shape on the wave-induced transport of floating marine litter. *in peer-review*
- **Peytavin, A.** Why we can't fact-check people, TedX CentraleSupélec, 2022
- **Peytavin A.** Building & Analyzing the World's Largest Beach Cleanup Database, Everyday AI San Francisco, 2023

HONORS AND AWARDS

- **Best Poster Award - Stanford ICME Xpo '23** - Yearly research symposium for MS and PhD students, out of 20 submissions - Spring, 2023
- **Threshold Venture Fellowship** - A highly-selective Stanford entrepreneurship program that provides fellows with a front-row seat to the world of venture creation - Winter, 2023
- **OVO Fellowship** - A \$ 10k stipend and mentorship to develop full-time and test the getalong.io platform - Summer, 2022
- **Digital Learning Education Award** - \$ 1500 awarded for getalong.io as an information literacy platform - Winter, 2022
- **Runner-up, Ocean Hackathon 2021 San Francisco** - An online beach cleanup collaboration platform - Fall, 2021

SKILLS SUMMARY

- **Programming** Python, C++, CUDA/OpenCL, JavaScript / Typescript, SQL, Julia
- **Frameworks** Scikit, Pytorch w/ PyG, numba, Flask, React.js and React Native, Node.js
- **Tools** Docker, Git, SQLite, VSCode, AWS, Azure
- **Design** Figma, Adobe Photoshop, Premiere Pro, After Effects
- **Soft Skills** Leadership, Public Speaking, Presentation, Project Management
- **Languages** **Fluent:** English, French **Intermediate:** Spanish

VOLUNTEER EXPERIENCE

- **Hyris Student Audiovisual Organization at CentraleSupélec** Paris, France
President March 2018 - March 2019
 - **Led a 40 people team for a year**, producing 200+ videos and 30+ shows. 40k€ turnover, +50% in a year
- **Covidproof.fr batch-testing project** Paris, France
Modeler, Staff Manager Spring 2021
 - **Modeled & piloted** a new covid batch testing strategy in CentraleSupélec. 20-people staff, 500 people tested.