Vadim Bertrand

https://github.com/vadmbertr/

+33 6 14 62 32 18
vadim.bertrand@gmail.com
Grenoble area
France

2nd year PhD student in Oceanography - Master's Degree in Statistics - Software Engineer

Education

2024— **PhD**, Institut des Géosciences de l'Environnement - Team **MEOM**
Stochastic Modelling of Drifting Object Trajectories at the Ocean Surface using Machine Learning
Supervised by Julien Le Sommer (CNRS Researcher), Emmanuel Cosme (UGA Professor) and Adeline Leclercq Samson (UGA Professor)
→ Implementing the `Python` package `pastax`

2023 **Master's Degree in Statistics and Data Science**, Université Grenoble Alpes - IM^{2}AG
Graduated with High Honors
Bayesian statistics, Computational statistics, Spatial statistics, Operations research and optimization, Non-parametric and functional estimation, Supervised and unsupervised learning

2014 **Engineering Degree**, Grenoble INP - Phelma / Ensimag
Signal processing, Algorithms and programming, Graph theory, Information theory

Academic and Professional Experience

2024—2025 **Summer School**, Ocean Training Course 2025 – Organized by the European Space Agency
Advanced Training Course on Ocean Synergy Remote Sensing focusing on the joint use of satellite and in-situ instruments to observe oceanic and atmospheric processes
Shore-based component of 14 training sessions on different Earth Observation satellite measurements
Ship-based component of 6 weeks from Tromsø (Norway) to Nice (France) aboard the Statsraad Lehmkuhl
→ Designed and assembled low-cost surface drifters deployed during the campaign, more details here
→ Organized a drifter position prediction challenge taking place during the shipboard training, see here

2023 **Research Engineer**, Institut des Géosciences de l'Environnement – Team **MEOM**
Variational cyclogeostrophic inversion for estimating ocean surface currents
Supervised by Emmanuel Cosme (UGA Full Professor) and Julien Le Sommer (CNRS Researcher)
→ Implemented the `Python` package `jaxparrow`, leveraging `JAX`. 10.5281/zenodo.14871648

2023 **Research Internship**, TIMC – Team **M**odels and **A**lgorithms for **Ge**nomics
Exploration of joint deconvolution algorithms for omic data (report, poster)
Supervised by Magali Richard (CNRS Researcher)

2022—2023 **Mentored Master's Project**, Université Grenoble Alpes - IM^{2}AG
Effect of anthropogenic noise on narwhals behavior (as part of this larger study)
Supervised by Adeline Leclercq Samson (UGA Full Professor)

2022 **Research Internship**, Laboratoire Jean Kuntzmann - Team **D**onnées, **A**pprentissage et **O**ptimisation
Deep generative learning for next-generation drugs (report)
Supervised by Sergei Grudinin (CNRS Researcher)

2016—2021 **Software Engineer**, Inria / GIPSA-lab - Team **D**ynamics **a**nd **C**ontrol of **N**etworks
Supervised by Carlos Canudas-de-Wit (CNRS Researcher)
→ Developed the web-application GTL-VILLE, collecting, estimating and predicting road traffic indicators in real time in the Grenoble Metropolis (subsequent publication)

Teaching

2024 **Computing and Data Analysis Project (Supervision of 2 students)**, Université Grenoble Alpes - Master in Earth, planetary and environmental sciences

2024 **Statistics (Practical Session)**, Université Grenoble Alpes - Bachelor in Biochemistry

Internship Supervision

2024 **Léo Boux de Casson (Bachelor, École Normale Supérieure de Lyon)**, with Julien Le Sommer
Eulerian comparison of lagrangian drifter velocities and reconstructed sea surface currents within the SWOT swath in the Mediterranean sea

2017 **Baptiste Gouin (Master, Université Paris Sud)**, with Giacomo Casadei
Aggregation and travel time calculation over large scale traffic networks

Scientific Activities

2025 **Journal Article** *in preparation* - V. Bertrand, J. Le Sommer, V. Zaia De Almeida, A. Samson, E. Cosme, *A Robust Variational Framework for Cyclogeostrophic Ocean Surface Current Retrieval.*

2024 **Journal Article** *under review at Genomic Biology* - E. Amblard, V. Bertrand, L. Martin Pena, S. Karkar, F. Chuffart, M. Ayadi, A. Baurès, L. Armenoult, Y. Kermezli, J. Cros, Y. Blum, M. Richard, *A robust workflow to benchmark deconvolution of multi-omic data.* 10.1101/2024.11.08.622633

2025 **Hackathon** - Attendee in the JAXATHON organized at IGE, Grenoble, France.
Gave an informal presentation of the JAX ecosystem. PDF

2024 **Poster Presentation** - *Stochastic and differentiable simulators of drifting objects trajectories*, EDITO WP2 Workshop, Grenoble, France. PDF

2024 **Oral Presentation** - *Cyclogeostrophic inversion for estimating Sea Surface Currents from SWOT altimeter data*, 30YPRA-OSTST, Montpellier, France. PDF

2024 **Poster Presentation** - *Cyclogeostrophic inversion for estimating Sea Surface Currents*, EGU, Vienna, Austria. 10.5194/egusphere-egu24-17489

2023 **Poster Presentation** - *Scoring and ranking strategies to benchmark cell type deconvolution pipelines*, JOBIM and ISMB, Nice and Lyon, France. PDF

2018 **Journal Article** - G. Casadei, V. Bertrand, B. Gouin, C. Canudas-de-Wit, *Aggregation and travel time calculation over large scale traffic networks: An empiric study on the Grenoble City.* Transportation Research Part C: Emerging Technologies, 2018. 10.1016/j.trc.2018.07.033

Open Source Contributions

Personal Projects, developper and maintainer of:

`pastax` *Parameterizable Auto-differentiable Simulators of ocean Trajectories in jAX*

`jaxparrow` *A package for computing the inversion of the cyclogeostrophic balance based on a variational formulation approach.* 10.5281/zenodo.14871648

Community Projects, contributor to:

`clouddrift` *Accelerates the use of Lagrangian data for atmospheric, oceanic, and climate sciences*

`quax` *Multiple dispatch over abstract array types in JAX*

`widetrax` *Toolbox for manipulating wide-swath altimetry ocean data*

Miscellaneous

Living languages

English: fluent, Spanish: notions

Programming languages

Python (JAX, PyTorch, NumPy, Xarray, etc...), Julia, R ; Git ; Shell scripting

Hobbies

Rugby (2 years in sports study) and now Touch rugby (what is this?), Running, Ski touring, Diving