

Quentin Klopfenstein

q.klopfenstein@gmail.com

Machine Learning Scientist

GitHub: Klopfe
Link to personal website

EDUCATION AND HONORS

Ph.D. in Applied Mathematics, *Université de Bourgogne, Dijon, France* **Oct. 2018- Sept. 2021**

- **Thesis:** Non-smooth optimization for the estimation of cellular immune components in a tumor
- Received Best PhD prize, EUR given by Institut de Mathématiques de Bourgogne (2021)
- Grant obtained to work on a research project with another researcher, see [GDR IA](#), 2019

Master degree in Applied Mathematics, *Université de Bourgogne, Dijon, France* **Sept. 2015- Sept. 2017**

- Graduated with high honors (mention Très bien) and Ranked 1/11
- Courses: Convex optimization, Data analysis, Statistical inference, Probability theory, C++ programming

Bachelor in Mathematics, *Université de Bourgogne, Dijon, France* **Sept. 2012- June 2015**

PROFESSIONAL EXPERIENCE

Post-doctoral researcher / Data Science group **October 2021 — Present**
Université du Luxembourg, Esch-sur-Alzette, Luxembourg

- Conducted ML analysis for the European project [DigiPD](#) with the goal to use interpretable models for clinicians.
- Developed and designed an open-source package that aims at solving Generalized Linear Models. The proposed algorithm **achieves 10 times speed-up** in comparison to sklearn.
- Supervised Ph.D students in our group working on machine learning and artificial intelligence topics.

Teaching assistant/Ph.D. student **October 2018- September 2021**
Université de Bourgogne, Dijon, France

- **Taught 150 hours of classes** for Bachelor students about statistics and probabilities.
- Led research projects with various collaborators related to convex optimization around ML.
- **Published 4 articles in prestigious ML journals/proceedings** and 3 in journals related to cancer research.

Biostatistician **October 2017- September 2018**
Centre Georges François Leclerc, Cancer Institute, Dijon, France

- **Obtained 500K€ grant** for the Cancer Institute to conduct ML research in immune cells quantification.
- Designed a software that uses ML models to detect immune cells on an image. Published work in top-tier oncology journal.
- Modeled a data derived score that can predict the risk of relapse for patients suffering from breast cancer. Represented the Cancer Institute in **the technology transfer process (patent)**.

SKILLS

Languages	Python, R, Java, C/C++
Machine Learning	Python (scikit-learn, numpy, pandas, matplotlib, tensorflow), Convex Optimization
Others	Git, \LaTeX , Markdown, Microsoft Visual Studio, High Performance Computer (HPC)
Language	French (native speaker), English (fluent)

LEADERSHIP

Student seminar leader **October 2019 — September 2021**
Université de Bourgogne, Dijon, France

- Organized the weekly student mathematical seminar. Scheduled the presentations and contacted the researchers.

President **March 2019 — March 2021**
Grain de Moutarde, Dijon, France

- Led an association that aims at helping people in needs and connect people together through various activities such as food distribution and social gathering. Organized meetings and wrote the annual reports.

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OPEN-SOURCE

A summary is available on my Github page: <https://github.com/Klopfe>

- **sparse-ho**: Hyperparameters tuning for sparse machine learning models (core developer)
- **skglm**: Python implementation of fast algorithms to solve sparse Generalized Linearized Models, part of scikit-learn-contrib (core developer)
- **benchopt**: Automatic benchmarking of optimization packages on standard machine learning tasks (contributor)
- **AC-SVR**: Automatic hyperparameters selection and constrained support vector regression for the estimation of cells quantities inside tumors (core developer)

PUBLICATIONS

Machine Learning Publications

1. Q. Bertrand, QK, M. Massias, M. Blondel, S. Vaiteer, A. Gramfort, J. Salmon. Implicit differentiation for fast hyperparameter selection in non-smooth convex learning. To appear soon, Journal of Machine Learning Research volume 23, pages 1-43, 2022
2. **Q. Klopfenstein**, Samuel Vaiteer. Linear Support Vector Regression with Linear Constraints. Machine Learning volume 110, pages 1939–1974, 2021
3. Q. Bertrand, **Q. Klopfenstein**, M. Blondel, S. Vaiteer, A. Gramfort, J. Salmon. Implicit differentiation of Lasso-type models for hyperparameter optimization. International Conference on Machine Learning, 2020

Preprints

1. Q. Bertrand, **Q. Klopfenstein**, P.A. Bannier, G. Gidel, M. Massias. Beyond L1: Faster and Better Sparse Models with skglm. Submitted. arXiv:2204.07826. 28 pages. 2022
2. **Q. Klopfenstein**, Q. Bertrand, A. Gramfort, J. Salmon, S. Vaiteer. Model identification and local linear convergence of coordinate descent. Submitted. arXiv:2010.11825. 26 pages. 2020

Computational biology

1. **Q. Klopfenstein**, V. Derangère, L. Arnould, M. Thibaudin et al. Evaluation of tumor immune contexture among intrinsic molecular subtypes helps to predict outcome in early breast cancer. JITC, 2021
2. C. Reichling, J. Taieb, V. Derangère, **Q. Klopfenstein** et al. Artificial intelligence-guided tissue analysis combined with immune infiltrate assessment predicts stage III colon cancer outcomes in PETACC08 study. Gut, 2019
3. **Q. Klopfenstein**, C. Truntzer, J. Vincent, F. Ghiringhelli. Cell lines and immune classification of glioblastoma define patient's prognosis. British Journal of Cancer, 2019
4. F. Ledys, **Q. Klopfenstein**, C. Truntzer, L. Arnould et al. RAS status and neoadjuvant chemotherapy impact CD8+ cells and tumor HLA class I expression in liver metastatic colorectal cancer. JITC, 2018
5. JD. Fumet, C. Richard, F. Ledys, **Q. Klopfenstein**, et al. Prognostic and predictive role of CD8 and PD-L1 determination in lung tumor tissue of patients under anti-PD-1 therapy. British Journal of Cancer, 2018
6. T. Collot, JD. Fumet, **Q. Klopfenstein**, J. Vincent et al. Bevacizumab-based Chemotherapy for Poorly-differentiated Neuroendocrine Tumors. Anticancer Research, 2018

SELECTED INVITED TALKS

- 2021-02-22: Implicit differentiation for fast hyperparameter selection in non-smooth convex learning, Université de Besançon
- 2020-07-14: ICML2020, Implicit differentiation of Lasso-type models for hyperparameter optimization, online conference