

# Quentin Bertrand

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## Education

- 2018–2021 **PhD in Computer Science**, *Inria*, Saclay.
- 2017–2018 **MS in Computer Science**, *École Normale Supérieure*, Cachan.
- 2014–2017 **BS and MS in Engineering**, *École polytechnique*, Palaiseau.

## Research highlights

I am currently a third year Ph.D. student in statistics and optimization under the supervision of [Joseph Salmon](#) and [Alexandre Gramfort](#) (core [scikit-learn](#) contributor). I work on model calibration for high dimensional sparse linear regression applied to brain signals reconstruction:

- Coordinate descent algorithms:
  - Proposed [Anderson extrapolation to accelerate coordinate descent](#) algorithms [1].
  - Showed [support identification and local linear convergence of coordinate descent](#) [2].
- Model calibration as an hyperparameter optimization problem:
  - Developed algorithms for [fast hyperparameter optimization of Lasso-type models](#) [3].
  - We are pushing this project further with a [high quality python package](#): `sparse-ho`.
- Model calibration as a statistical problem:
  - Theoretically studied the [statistical influence of smoothing parameters](#) for the *square-root Lasso* and the *multivariate square-root Lasso* [4].
  - Formulated optimization problems to handle sparse linear regression with correlated noise as smoothing-based optimization problems, [5], [code](#).

## Work Experience

- 2017 **Stanford Research Institute**, *Research Intern*, Menlo Park, CA.
  - Worked on the DARPA project [Probabilistic Programming for Advanced Machine Learning](#).
  - Developed and implemented new algorithms to compute exact bounds in graphical models.

## References

- [1] **Q. Bertrand** ; M. MASSIAS: Anderson acceleration of coordinate descent. In: *AISTATS* (2021)
- [2] Q. KLOPFENSTEIN ; **Q. Bertrand** ; A. GRAMFORT ; J. SALMON ; S. VAITER: Model identification and local linear convergence of coordinate descent. In: *arXiv preprint arXiv:2010.11825* (2020)
- [3] **Q. Bertrand** ; Q. KLOPFENSTEIN ; M. BLONDEL ; S. VAITER ; A. GRAMFORT ; J. SALMON: Implicit differentiation of Lasso-type models for hyperparameter optimization. In: *ICML* (2020)
- [4] M. MASSIAS ; **Q. Bertrand** ; A. GRAMFORT ; J. SALMON: Support recovery and sup-norm convergence rates for sparse pivotal estimation. In: *AISTATS* (2020)

- [5] **Q. Bertrand** ; M. MASSIAS ; A. GRAMFORT ; J. SALMON: Handling correlated and repeated measurements with the smoothed multivariate square-root Lasso. In: *NeurIPS* (2019)

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## Teaching

- 2020-2021 [Optimization for Machine Learning](#), Data Science Summer School of École polytechnique, **lecturer**, 6h.
- 2020-2021 [Python for Data Science](#), MS X-HEC, **teaching assistant**, 40h.
- 2019-2021 [Optimization for Data Science](#), MS Data Science, **teaching assistant**, 2\*20h, Prof.: [A. Gramfort](#) and [R. Gower](#).
- 2019-2020 [Numerical Methods and Applications](#), BS ENSAE, **teaching assistant**, 30h, Prof.: [S. M. Kaber](#).

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## Awards

- 2019 [NeurIPS](#) travel award, I was awarded a grant from [GDRIA](#) to visit [Samuel Vaiter](#).

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## Miscellaneous

On my free time I like to swim and to play chess ([2200 elo](#)).