

Romain Lopez

Curriculum Vitae

Probabilistic models for biology and single-cell RNA sequencing: high-dimensional statistics, representation learning and Bayesian inference

Education

- 2016– **PhD candidate in Electrical Engineering and Computer Sciences**, *University of California, Berkeley, USA.*
Affiliations: Berkeley Artificial Intelligence Research, Center for Computational Biology
Supervisors: Michael I. Jordan, Nir Yosef
Coursework includes: Graphical models, high-dimensional statistics, convex optimization, variational inference.
- 2013–2016 **Diplome d'Ingénieur**, *École polytechnique, Palaiseau, France.*
Affiliation: Centre de Mathématiques Appliquées (CMAP)
Supervisors: Laurent Massoulié, Erwan Le Pennec
Research Interests: Optimal stochastic control on random graphs, time-series classification
Coursework includes: statistical learning theory, stochastic processes, dynamical systems, variational calculus and distribution theory.

Award and Scholarships

- 2016 Fulbright-France Fellowship, Fondation Monahan
2016 Carnot Foundation Fellowship
2016 William Oldham Fellowship, UC Berkeley, EECS
2015 Outstanding Investment, École polytechnique
2014 National Defence Medal, Bronze Echelon.

Research Experience

- 2018 **Research-based Software Engineer**, *Ant Financial, Hangzhou, China.*
Fintech company operating Alipay, the world's largest mobile and online payments platform
Supervisor: Le Song
Counterfactual inference for estimating responses to economical incentives. Application to efficient coupon allocation for mobile marketing campaigns.
- 2015 **Graduate Research Fellow**, *Harvard Medical School, Boston, USA.*
One of the first laboratories that achieved efficient single-cell RNA sequencing
Supervisor: Allon Klein
Visiting the Systems Biology department. Developing methodology for single-cell RNA sequencing data analysis (Sparse Matrix Factorization).

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Teaching Experience

- Spring 2018 **Head Graduate Student Instructor**, *University of California, Berkeley, USA.*
EE127 / EE227A: Convex Optimization
Instructor: Laurent El Ghaoui
Duties included the logistic for the class (200 students, 4 teaching assistants, 3 readers), conducting discussion sections, preparing homeworks, grading midterms and final exams, occasionally lecturing and proposing a project on sparse optimization to students.
- Fall 2018 **Graduate Student Instructor**, *University of California, Berkeley, USA.*
EE127 / EE227A: Convex Optimization
Instructor: Laurent El Ghaoui and Alexandre Bayen
Duties included managing the homework team: five undergraduate students designing, testing and validating the problem sets.

Industry Experience

- 2015 **Quantitative Analyst**, *Cardiologs, Paris, France.*
FDA-cleared AI based EKG analysis, raised 6.4 M\$ in 2017
Supervisor: Jia Li, Co-founder & CSO
Developing algorithms facilitating the diagnosis of cardiovascular diseases by physicians. Reconstructed EKGs 3D signal from a 2D projection using convolutional neural networks.
- 2015 **Business Analyst**, *AXA Life Japan, Tokyo, Japan.*
Second most important subsidiary of AXA group regarding medical insurance
Supervisor: Takashi Nojima, Head of Pricing and Product development
Predictive modeling, pricing sheets, stress tests and technical reports for a specific medical insurance product.

Leadership Experience

- 2017- **French Alumni Berkeley, Founder.**
Connecting Berkeley students that share a part of their education in France with Alumni.
Organizing monthly meetings with startups in San Francisco, bi-monthly networking events on campus. Collaboration with the French consulate, industry and diverse associations.
- 2014 **Freshman Weekend, Treasurer, Vice-President**, *École polytechnique.*
In charge of the \$160k budget and co-organising the event for 600 students.
- Sept 2013- **Officer Cadet**, *French Ministry of Defence, Reunion Island, Indian Ocean.*
April 2014 *Military training for underprivileged youth towards the job market.*
Supervised the military recruit training of thirty people and their five supervisors.

Mentoring Experience

- March 2018 – **Internship Recruiting and Supervision**, *Yosef Lab.*
- Maxime Langevin, **Prix du stage de recherche 2018** from École polytechnique, scRNA-seq and smFISH harmonization using scVI.
 - Edouard Mehlman, Master Thesis with École normale supérieure Cachan, simultaneous Harmonization and Cell-Type Annotation using scVI.
 - Jules Samaran, BSc student from Mines ParisTech

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Research

Peer-reviewed publications

- [1] Romain Lopez, Jeffrey Regier, Michael B. Cole, Michael I. Jordan, and Nir Yosef. Bayesian inference for a generative model of transcriptome profiles from single-cell RNA sequencing. *Nature Methods*, 2018.
- [2] Romain Lopez, Jeffrey Regier, Michael I. Jordan, and Nir Yosef. Information Constraints on Auto-Encoding Variational Bayes. *Advances in Neural Information Processing Systems*, 2018.
- [3] Samuel L. Wolock, Romain Lopez, and Allon M. Klein. Scrublet: computational identification of cell doublets in single-cell transcriptomic data. *Cell Systems*, 2018.

Presentations

- [1] Chenling Antelope, Edouard Mehlman, Romain Lopez, Jeffrey Regier, and Nir Yosef. Simultaneous harmonization and cell-type annotation using scVI. *Single Cell Genomics conference, Poster*, 2018.
- [2] Maxime Langevin, Edouard Mehlman, Jeffrey Regier, Romain Lopez, Michael I. Jordan, and Nir Yosef. A Deep Generative Model for Semi-Supervised Classification with Noisy Labels. *Bay Area Machine Learning Symposium, Oral*, 2018.
- [3] Maxime Langevin, Jeffrey Regier, Romain Lopez, Michael I. Jordan, and Nir Yosef. scRNA-seq and smFISH harmonization using scVI. *Single Cell Genomics conference, Poster*, 2018.
- [4] Romain Lopez. A deep generative model for gene expression profiles from single-cell RNA sequencing. *Northern California Computational Biology Symposium, Oral*, 2017.
- [5] Romain Lopez. Deep generative models and single-cell RNA sequencing. *UC Berkeley CS294 Machine Learning and Statistics Meet Biology – guest speaker*, 2017.
- [6] Romain Lopez, Jeffrey Regier, Michael I. Jordan, and Nir Yosef. A deep generative model for gene expression profiles from single-cell RNA sequencing. *Bay Area Machine Learning Symposium, Oral*, 2017.
- [7] Romain Lopez, Jeffrey Regier, Michael I. Jordan, and Nir Yosef. A deep generative model for gene expression profiles from single-cell RNA sequencing with application to differential expression. *NIPS Machine Learning workshop in Computational Biology, Lightning talk*, 2017.
- [8] Romain Lopez, Jeffrey Regier, Michael I. Jordan, and Nir Yosef. A deep generative model for gene expression profiles from single-cell RNA sequencing. *Single Cell Biology conference, Poster*, 2018.

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