Romain Lopez

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Education

2016 – 2021 **Ph.D. candidate in Electrical Engineering and Computer Sciences**
University of California, Berkeley, USA
affiliations: Berkeley Artificial Intelligence Research, Center for Computational Biology
advisor: Michael I. Jordan & Nir Yosef

2013 –2016 **Diplome d'Ingénieur; M.S. in Applied Mathematics**
École polytechnique, France
affiliations: Centre de Mathématiques Appliquées
advisors: Laurent Massoulié & Erwan Le Pennec

Awards & fellowships

2019 Travel award. NeurIPS Workshop in Learning Meaningful Representations of Life

2019 Best Student Poster Award. ICML Computational Biology Workshop

2016 Berkeley PhD Fellowship (William Oldham)

2016 Fulbright-France Fellowship, Monahan Foundation

2016 Carnot Foundation Fellowship, annually awarded to 2 students from École polytechnique

2015 Outstanding Investment Medal, École polytechnique awarded annually to 10% of students for their dedication to the student body.

2014 French National Defence Medal, Bronze Echelon, Army expeditionary troops

2011 Southern France Merit-based Fellowship (Region Languedoc Roussillon)

2011 Black belt, French Judo Federation

Publications

Journal articles

Samuel L. Wolock, **Romain Lopez**, and Allon M. Klein. "Scrublet: Computational Identification of Cell Doublets in Single-cell Transcriptomic Data". In: *Cell Systems* (2019). [PDF]

Romain Lopez, Jeffrey Regier, Michael B. Cole, Michael I. Jordan, and Nir Yosef. "Deep Generative Modeling for Single-cell Transcriptomics". In: *Nature Methods* (2018). [PDF]

Articles in highly selective conference proceedings

Romain Lopez, Pierre Boyeau, Nir Yosef, Michael I. Jordan, and Jeffrey Regier. "Decision-Making with Auto-Encoding Variational Bayes". In: *Advances in Neural Information Processing Systems* (2020). [PDF]

Romain Lopez, Chenchen Li, Xiang Yan, Junwu Xiong, Michael I. Jordan, Yuan Qi, and Le Song. "Cost-Effective Incentive Allocation via Structured Counterfactual Inference". In: *AAAI Conference on Artificial Intelligence* (2020). [PDF]

Romain Lopez, Jeffrey Regier, Michael I. Jordan, and Nir Yosef. "Information Constraints on Auto-Encoding Variational Bayes". In: *Advances in Neural Information Processing Systems* (2018). [PDF]

Review Articles

Romain Lopez, Adam Gayoso, and Nir Yosef. "Enhancing Scientific Discoveries in Molecular Biology with Deep Generative Models". In: *Molecular Systems Biology* (2020). [PDF]

Manuscripts in submission

Adam Gayoso*, Zoë Steier*, **Romain Lopez**, Jeffrey Regier, Kristopher L Nazor, Aaron Streets, and Nir Yosef. "Joint Probabilistic Modeling of Paired Transcriptome and Proteome Measurements in Single Cells". In: *Submitted* (2020). [PDF]

Chenling Xu*, **Romain Lopez***, Edouard Mehlman*, Jeffrey Regier, Michael I. Jordan, and Nir Yosef. "Probabilistic Harmonization and Annotation of Single-cell Transcriptomics Data with Deep Generative Models". In: *Submitted* (2020). [PDF]

Romain Lopez, Inderjit Dhillon, and Michael I. Jordan. "Learning from eXtreme Bandit Feedback". In: *Submitted* (2020). [PDF]

Refereed workshop papers

Pierre Boyeau, **Romain Lopez**, Jeffrey Regier, Adam Gayoso, Michael I. Jordan, and Nir Yosef. "Deep Generative Models for Detecting Differential Expression in Single Cells". In: *Machine Learning in Computational Biology (MLCB)* (2019). [PDF]

Oscar Clivio, **Romain Lopez**, Jeffrey Regier, Adam Gayoso, Michael I. Jordan, and Nir Yosef. "Detecting Zero-Inflated Genes in Single-Cell Transcriptomics Data". In: *Machine Learning in Computational Biology (MLCB),* ***Spotlight talk*** (2019). [PDF]

Adam Gayoso, **Romain Lopez**, Zoë Steier, Jeffrey Regier, Aaron Streets, and Nir Yosef. "A Joint Model of RNA Expression and Surface Protein Abundance in Single Cells". In: *Machine Learning in Computational Biology (MLCB)* (2019). [PDF]

Romain Lopez*, Achille Nazaret*, Maxime Langevin*, Jules Samaran*, Jeffrey Regier*, Michael I Jordan, and Nir Yosef. "A Joint Model of Unpaired Data from scRNA-seq and Spatial Transcriptomics for Imputing Missing Gene Expression Measurements". In: *ICML Workshop in Computational Biology,* ***Spotlight talk***, ***Best student poster award*** (2019). [PDF]

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". In: *Bay Area Machine Learning Symposium,* ***Oral presentation*** (2018). [PDF]

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". In: *NeurIPS Machine Learning workshop in Computational Biology,* ***Spotlight talk*** *and Bay Area Machine Learning Symposium,* ***Oral presentation*** (2017). [PDF]

Presentations

Invited talks

July 2020	Applied Bayesian Group (Regier) @ University of Michigan, reading group
May 2020	Amazon, ML Search team @ Berkeley, research presentation
Apr 2020	CPSC663 @ Yale University, Deep Learning Theory and Applications, guest speaker
Feb 2020	10x Genomics, Journal Club
Nov 2019	Normalization Workshop, Chan Zuckerberg Initiative & NY Genome Center
Nov 2019	Broad Institute of MIT and Harvard, Models, Inference & Algorithms special seminar
Nov 2019	Dana Farber Cancer Institute, Data Science departmental seminar
Nov 2019	Pfizer, Machine Learning seminar
Nov 2019	Celsius Therapeutics, seminar
Oct 2019	Google Brain Paris, seminar
March 2019	Deep Learning for Biomedicine, UCSF
Sept 2018	Biostatistics Lab (Dudoit, Purdom) @ UC Berkeley, group meeting
Nov 2017	CS294 @ UC Berkeley, Machine Learning and Statistics meet Biology, guest speaker
Feb 2017	Two Sigma Investments, seminar

Contributed talks

Oct 2019	Beyond the cell atlas, lightning talk
June 2019	ICML workshop in Computational Biology, lightning talk
Oct 2018	Northern California Computational Biology Symposium, oral presentation
Dec 2017	NeurIPS Machine Learning workshop in Computational Biology, lightning talk
Oct 2017	Northern California Computational Biology Symposium, oral presentation

Oct 2017 Bay Area Machine Learning Symposium, oral presentation

Posters

Dec 2019 NeurIPS Workshop on Learning Meaningful Representations of Life

Sept 2019 Single-cell Genomics conference

Jun 2019 UC-wide AI in Biomedicine Symposium

Oct 2018 Single-cell Genomics conference

March 2018 Single-cell Biology conference

Teaching experience

June 2020 Single cell profiling and analysis in neuroscience, *University of Bordeaux, France*
CAJAL Advanced Neuroscience Training Program, Summer school.
Computational Biology Instructor. *Postponed.*

Fall 2019 Electrical Engineering 127 / 227A, *University of California, Berkeley*
Advanced undergraduate and graduate course in convex optimization.
Graduate Student Instructor.

Spring 2019 Electrical Engineering 127 / 227A, *University of California, Berkeley*
Advanced undergraduate and graduate course in convex optimization.
Head Graduate Student Instructor.

Academic appointments

April 2016 –Aug 2016 Harvard Medical School, *Visiting Research Fellow, Boston.*
Hosted by Allon Klein. Understanding cell fate decisions based on statistical methods for analyzing single-cell RNA sequencing data. Artifacts detection for single-cell transcriptomics data.

Industry experience

Sept 2019 –Apr 2020 Amazon, *Applied Scientist Intern, Berkeley.*
Hosted by Inderjit Dhillon. Research on counterfactual inference with extremely large action spaces. Application to search algorithms for Amazon online platform.

June 2018 –Aug 2018 Ant Financial Services Group, *Research-based Software Engineer Intern, Hangzhou.*
Hosted by Le Song. Research on counterfactual inference for estimating responses to economical incentives. Application to efficient coupon allocation for mobile marketing campaigns.

Aug 2017 –Jan 2018 — Codi (formerly Hiven), *Entrepreneurship project, UC Berkeley.*
Customer discovery and prototype. Codi connects remote workers with home-based workspaces right in their neighborhood.

Sept 2015 –Feb 2016 — Cardiologs, *Data Scientist Intern, Paris.*
Hosted by Jia Li, Co-founder & CSO. Cardiologs develops a FDA-cleared AI based EKG analysis software and raised 6.4 M$ in 2017. Reconstructed EKGs 3D signal from a 2D projection using convolutional neural networks and Theano.

June 2015 –Aug 2015 — AXA Life Japan, *Actuarial Intern, Tokyo*
Hosted by Takashi Nojima, Head of Pricing and Product development. AXA Life Japan was the second most important subsidiary of AXA group regarding medical insurance in 2015. Predictive modeling, pricing sheets, stress tests and technical reports.

Journal & conference reviewing

2021 – AAAI Conference on Artificial Intelligence (AAAI)
2021 – International Conference on Learning Representations (ICLR)
2020 – Neural Information Processing Systems (NeurIPS)
2020 – Science Advances
2020 – Bioinformatics
2020 – ICML Workshop in Computational Biology (WCB)
2019 – International Conference on Machine Learning (ICML)
2019 – Nature Methods
2019 – Machine Learning in Computational Biology (MLCB)

University & national service

Oct 2019 –Aug 2020 — Diversifying Access to Research in Engineering, UC Berkeley, *Research Mentor.*
Provide undergraduate students with research opportunities in EECS and to promote diversity.

May 2018 –Aug 2020 — Yosef Lab, UC Berkeley, *Intern Recruiting and Mentoring.*
Recruitment and mentoring of visiting students in the Yosef Lab working on their undergraduate or master's thesis. Designed screening exams, conducted interviews, provided projects and organized regular working group with students.

Maxime Langevin† (2018), now *PhD student* @ ENS, Paris and Sanofi.
Edouard Mehlman (2018), now *data scientist* @ Feedly.
Yining Liu (2018), now *PhD student* @ Columbia University, CS.
Jules Samaran (2018), now *visiting researcher* @ Osaka University.
Achille Nazaret† (2019), now *PhD student* @ Columbia University, CS.
Oscar Clivio (2019), now *PhD student* @ Oxford University, CS.

Gabriel Misrachi (2019), now *data scientist* @ Cardiologs.
Pierre Boyeau (2019), now *PhD student* @ UC Berkeley, EECS.
Khalil Ouardini (2020), now *MSc Student* @ ENS Cachan, MVA.
†: Best Research Award from École polytechnique for their internship work.

Sept 2017 –Aug 2019 — French Alumni Berkeley, *Founder.*
Connecting Berkeley students that share a part of their education in France with Alumni. Organized monthly meetings with startups in San Francisco, bi-monthly networking events on campus. Collaboration with the French consulate, industry and diverse associations.

Oct 2014 –Jul 2015 — Freshman Weekend of École polytechnique, *Treasurer & Vice-President.*
In charge of the $160k budget and co-organising the event for 600 students.

Oct 2013 –Apr 2014 — French Ministry of Defence, *Officer Cadet, Reunion Island, Indian Ocean*
Military training for underprivileged youth towards the job market. Supervised the military recruit training of thirty people and their five supervisors.

Press

"scVI with Romain Lopez and Gabriel Misrachi". In: *The Bioinformatics Chat* (Sept 2019).

"Hyperparameter search for scVI". In: *YosefLab Blog* (July 2019).

"Deep generative modeling for single-cell transcriptomics, Fabian Theis". In: *F1000Prime Recommendation (Exceptional)* (July 2019).

"Should we zero-inflate scVI?" In: *YosefLab Blog* (June 2019).

"Building Gene Expression Atlases with Deep Generative Models for Single-cell Transcriptomics". In: *Berkeley Artificial Intelligence Research Blog* (Dec 2018).

"Bayesian deep learning for single-cell analysis". In: *Nature Methods* (Nov 2018).

"Integrating scRNA-seq and spatial STARmap data from mouse frontal cortex with scVI". In: *What Do You Mean "Heterogeneity"?* (Oct 2018).

"Count based autoencoders and the future for scRNA-seq analysis". In: *What Do You Mean "Heterogeneity"?* (Apr 2018).