Laura Greenstreet

I am a PhD student at Cornell developing AI and optimization methods with sustainability applications. Previously, I worked with Dr. Claire Kremen to scale an analysis of functional connectivity to the global level and with Dr. Geoffrey Schiebinger to develop optimization methods for single-cell genomics.

Education

2021 - Present **Ph.D. Computer Science**, Cornell University
Research areas: Deep Learning, Optimization, AI/ML for Science

2020 **B.Sc. Honours Computer Science, Mathematics Minor**,
University of British Columbia

Publications

- 2023 **Greenstreet, L.**, A. Afanassiev, Y. Kijima, M. Heitz, S. Ichiguro, et al. *DNA-GPS: A Theoretical Framework for Optics-Free Spatial Genomics and Synthesis of Current Methods.* Cell Systems, 2023. https://doi.org/10.1016/j.cels.2023.08.005
- 2023 Mirka, R., **L. Greenstreet**, M. Grimson, C.P. Gomes. *A New Approach to Finding 2 x n Partially Spatially Balanced Latin Rectangles*, CP, 2023.
- 2022 Brennan, A., R. Naidoo, **L. Greenstreet**, Z. Mehrabi, N. Ramankutty, C. Kremen. *Functional Connectivity of the Worlds Protected Areas.* Science, 2022. https://doi.org/10.1126/science.abl8974
- 2022 **Greenstreet, L.**, N.J.A. Harvey, V. Sanches Portella. *Efficient and Optimal Fixed-Time Regret with Two Experts.* ALT, 2022. https://doi.org/10.48550/arXiv.2203.07577
- 2021 Zhang, S., A. Afanassiev, **L. Greenstreet**, T. Matsumoto, G. Schiebinger. *Optimal transport analysis reveals trajectories in steady-state systems.* PLOS Computational Biology, 2021. https://doi.org/10.1371/journal.pcbi.1009466
- 2021 Li, H., J. Ezike, A. Afanassiev, **L. Greenstreet**, et al. *Single Cell Analysis Elucidates the Maturation of Human Stem and Progenitor Cell Function from Fetal through Adult Hematopoiesis.* Blood, 2021. https://doi.org/10.1182/blood-2021-151090
- 2021 Shahan R., C. Hsu, T.M. Nolan, B.J. Cole, I.W. Taylor, **L. Greenstreet**, et al. *A single cell Arabidopsis root atlas reveals developmental trajectories in wild type and cell identity mutants.* Developmental Cell, 2021. https://doi.org/10.1016/j.devcel.2022.01.008
- 2020 Massri, A.J., **L. Greenstreet**, A. Afanassiev, A. Berrio Escobar, G.M. Wray, G. Schiebinger, D.R. McClay. *Developmental Single-cell transcriptomics in the* Lytechinus variegatus *Sea Urchin Embryo.* Development, 2020. https://doi.org/10.1242/dev.198614

Workshops and Presentations

- 2023 **Greenstreet, L**, J. Fan, F. Siqueira Pacheco, Y. Bai, M. Eichemberger Ummus, et al. *Detecting Aquaculture with Deep Learning in a Low-Data Setting.* SigKDD 2023 Fragile Earth Workshop.
- 2020 **Greenstreet, L**, and E. Lai. *Developing a Data-Driven Electric Vehicle Strategy in Surrey, BC.* SigKDD 2020 Social Impact Session.

Bioinformatics Geospatial Theory

Awards

2022-2024	**Graduate Teaching Award x4**, Department of Computer Science, Cornell University
2020	**Undergraduate Summer Research Award**, Natural Sciences and Engineering Research Council of Canada (NSERC)
2019	**Data Science for Social Good Fellowship**, UBC Data Science Institute
2018	**Stanley M Grant Scholarship in Mathematics**, UBC Department of Mathematics

Languages and Technologies

3+ Years Experience: Python, Git, Linux

1-3 Years Experience: R, Julia, Matlab, Java, SQL

Libraries/Tools: Pytorch, scipy, Geopandas, cvxpy, sklearn, QGIS, Postgres, Gurobi, CPLEX

Experience: deep learning with geospatial data, contrastive learning, manifold learning, optimization, data processing for geospatial and single-cell sequencing data, SQL database development and integration

Research Experience

05/2023 - 01/2024	**Research Assistant**, Computational Sustainability Lab, Department of Computer
05/2022 - 08/2022	Science, Cornell University
05/2020 - 08/2021	**Research Assistant**, Schiebinger Lab, Department of Mathematics, University of British Columbia
09/2019 - 09/2020	**Research Assistant**, WoRCS Lab, Institute for Resources, Environment, and Sustainability, University of British Columbia
05/2019 - 08/2019	**Fellow - Data Science for Social Good Program**, University of British Columbia Data Science Institute

Work Experience

09/2022 - 05/2023	**Head Teaching Assistant**, Cornell University, Ithaca, NY CS 2700 - Excursions in Computational Sustainability CS 4700/4701 - Foundations/Practicum in Artificial Intelligence
01/2024 - 05/2024	**Teaching Assistant**, Cornell University, Ithaca, NY
09/2021 - 05/2022	CS 4220 - Numerical Analysis: Linear and Nonlinear Problems CS 3220 - Computational Mathematics for Computer Science
10/2021 - 11/2021	**Database Consultant**, City of Surrey, Vancouver BC
01/2019 - 05/2019	**eTextbook Developer**, University of British Columbia Library, Vancouver, BC
07/2015 - 08/2017	**Information Technology Coordinator**, Tilth Alliance, Seattle, WA

Community Involvement

2024	**Organizer**, AI for Science Seminar
2023	**Organizer**, NeurIPS Computational Sustainability Workshop
2023	**Mentor**, BURE Undergraduate Research Program, Cornell
2023-2024	**Assistant Organizer**, AI for Science Program, Cornell
2020-2021	**Mentor**, Data Science for Social Good Program, UBC Data Science Institute