Eric Sager Luxenberg

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RESEARCH INTERESTS

I am broadly interested in convex optimization and its applications to control, machine learning and finance, and seek to develop new algorithms and open source tools for solving problems in these areas.

EDUCATION

Stanford University

Ph.D., Electrical Engineering — Sept 2020 - Present
Advisor: Stephen Boyd
GPA: 4.0

M.S., Electrical Engineering, — Sept 2019 - Mar 2020
GPA: 3.9

B.S., Mathematics, — Sept 2015 - June 2019
GPA: 3.9

RELEVANT COURSEWORK (* GRADUATE)

Computer Science: Programming Abstractions, Systems, Machine Learning*, Algorithms, Convolutional Neural Nets*, Randomized Algorithms*, Reinforcement Learning*, Discrete Math and Algorithms*
Mathematics: Honors Multivariable Mathematics, Complex Analysis, Scientific Computing, Stochastic Methods*, Groups and Rings, Real Analysis*, Theory of Probability*, Dynamic Programming and Stochastic Control*, Theory of Statistics*, Optimization Theory*, Machine Learning Theory*
Electrical Engineering: Signal Processing and Linear Systems, Information Theory*, Fourier Transform*, Linear Dynamical Systems*, Convex Optimization*, Inference Estimation and Information Processing*, Large Scale Matrix Computation*

PUBLICATIONS

T Baharav, R Kang, C Sullivan, M Tiwari, **E Luxenberg**, D Tse, M Pilanci. *Adaptive Sampling for Efficient Softmax Approximation*. The Thirty-eighth Annual Conference on Neural Information Processing Systems.

E Luxenberg, S Boyd. *Exponentially Weighted Moving Models*. arXiv preprint.

E Luxenberg, D Malik, Y Li, A Singh, S Boyd. *Specifying and Solving Robust Empirical Risk Minimization Problems Using CVXPY*. Journal of Optimization Theory and Applications.

P Schiele*, **E Luxenberg***, and S Boyd. *Disciplined Saddle Programming*. Transactions on Machine Learning Research.

E Luxenberg*, P Schiele*, S Boyd. *Robust Bond Portfolio Construction via Convex-Concave Saddle Point Optimization*. Journal of Optimization Theory and Applications.

E Luxenberg, S Boyd, M van Beek, W Cao, M Kochenderfer. *Strategic Asset Allocation with Illiquid Alternatives*. Proceedings of the Third ACM International Conference on AI in Finance, 249-256.

E Luxenberg*, P Schiele*, S Boyd. *Portfolio Optimization with Cumulative Prospect Theory Utility via Convex Optimization*. Computational Economics.

E Luxenberg, S Boyd. *Portfolio Construction with Gaussian Mixture Returns and Exponential Utility via Convex Optimization*. Optimization and Engineering.

RA Fernandes, C Li, G Wang, X Yang, CS Savvides, CR Glassman, ... RA Fernandes, C Li, G Wang, X Yang, CS Savvides, CR Glassman, S Dong, **E Luxenberg**, LV Sibener, ME Birnbaum, C Benoist, D Mathis, KC Garcia. *Discovery of surrogate agonists for visceral fat Treg cells that modulate metabolic indices in vivo*. Elife 9.

JW Khor, N Jean, **E Luxenberg**, S Ermon, SKY Tang. *Using machine learning to discover shape descriptors for predicting emulsion stability in a microfluidic channel*. Soft matter 15 (6), 1361-1372.

EMPLOYMENT

Research Scientist at Gridmatic: June 2024 -
Optimization algorithms and applications in the energy markets.

QR Intern at Citadel: June 2023 - August 2023
On the Equity Model Research team within Equity Quantitative Research.

BlackRock AI Labs Student Research Intern: June 2021 - Dec 2022
Convex optimization based strategic asset allocation with illiquid alternatives

Machine Learning Consultant (3T Biosciences): Mar 2020 - Sept 2020
Designed and implemented a pipeline for predicting T-cell activity

TEACHING EXPERIENCE

Instructor, Stanford EE364a (Convex Optimization) Summer 2021-22
- Delivered 20 1.5 hour lectures, created exams and problem sets, managed course assistants

Head Course Assistant, Stanford EE364a (Convex Optimization) Winter 2021-22
- Managed a team of 5 course assistants for a class of 230+ students

Course Assistant, Stanford EE364a (Convex Optimization) Winter 2019-20
Course Assistant, Stanford EE263 (Linear Dynamical Systems) Fall 2019-20

TECHNICAL SKILLS

Programming: Python, Julia, CVXPY

PROFESSIONAL SERVICE

Paper reviewing:
- 4th Annual Learning for Dynamics & Control Conference
- IEEE Transactions on Automatic Control