AUBREY CLARK

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WORK

Data Scientist | Google Global Infrastructure April 2023 –

- Analyze traffic engineering across Google's backbone: demand-approval gaps, QoS-SLO mapping, link utilization risk under routing fallback
- Spectral methods and Shapley values to quantify demand correlation, reducing network overbuild by 1.5–2x
- Production ML system predicting optical component failures; survival analysis for design cycle times
- Power-to-fiber forecasting model predicting infrastructure build needs 18 months ahead

Data Scientist | Twitter August 2021 – March 2023

- Designed a critical path algorithm over distributed traces to find bottlenecks in Twitter's serving stack
- Rewrote the spam classifier to use reply timing, cutting false positives on legitimate accounts
- Ran experiments on cluster scheduling that reduced compute costs

Data Scientist | Wealthfront August 2018 – July 2021

- Designed the optimization engine for Wealthfront's automated financial advisor: a stochastic mixed-integer program solved with Benders decomposition, for 250,000 users
- Built an internal order matching system that netted client trades before routing to market, reducing transaction costs

Research Fellow | University of Cambridge 2017 – 2018

- Game Theory, Information Economics. Research in market design and allocation theory

EDUCATION

Ph.D., Economics, Harvard University 2017
Mechanism Design. Committee: Eric Maskin (Chair), Oliver Hart

B.Sc. Mathematics / B.Econ., University of Queensland, Australia 2009
First Class Honours, University Medal

PROJECTS

- **Communication Systems from Scratch**: BGP, TCP/IP, Audio Modem, QUIC, BBR, Protocol Buffers, HTTP/3, and gRPC
- **Financial Planning in the AI Era**: An AI financial advisor built from bank statements and a single prompt document
- **Algorithmic Mechanism Design**: Probabilistic Serial and Constrained Birkhoff-von Neumann algorithms for fair allocation

RESEARCH

Contracts for Acquiring Information. Clark, A. and Reggiani, G. arXiv:2103.03911, 2017

Capacity Constraints in Principal-Agent Problems. Clark, A. arXiv:2412.01760, 2017

Core Equivalence with Large Agents. Clark, A. arXiv:2103.05136, 2017

SKILLS

Machine learning · Optimization · Infrastructure · Mechanism design · Operations research

Day-to-day: Python, SQL, C++, Shell · Infrequent: Rust, Scala, R, Julia