Matz Andreas Haugen

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Education

2011-2016: PhD, Stanford University.
Advisors: Bala Rajaratnam and Paul Switzer
Dept. of Statistics and Dept. of Environmental Earth Systems Science

2011-2015: M.Sc. in Statistics, Stanford University.

2010-2011: Master of Adv. Study (Merit), Physics, Cambridge University.

2008-2010: M.Sc. Energy Resources Engineering (GPA: 3.8/4), Stanford University.

2005-2008: B.Sc. Physics (GPA: 3.8/4), McGill University.

Work Experience

Senior Quantitative Engineer/Consultant: Mar 2021-Current, Vise AI Advisors, LLC, Remote, Oslo, Norway.

- Chief architect for the core portfolio optimizer which manages all the ~3000 Vise accounts in a tax-aware manner currently with $ 2.5 billion USD in assets under management, up from 100 Million USD when I joined the company.
- Chief architect for the long-short leveraged portfolio optimizer providing both risk controls and tax efficientcy powering Vise's high yield/high fee product vision, positioning Vise are a market leader in tax aware portfolio management.
- Migrated all accounts over from previous generation mixed-integer portfolio optimizer to the next generation convex relaxation with added integer heuristics reducing optimization time from minutes to ~1s/account while aligning with new investment strategy and increasing explainability.

Senior Machine Learning Engineer: Jan 2020-Feb 2021, Cognite AS, Oslo, Norway.

- Building a platform to create, schedule and deploy Python code securely in the cloud with tools like Kubernetes and PubSub, enabling data scientists to automate analysis with tailored compute power and cadence.

Senior Data Scientist: Feb 2018-Oct 2019, Orbital Insight, Palo Alto, California.

- Built out the company's ability to use alternative geolocation data to infer economic indicators by handling massive amounts of raw data (>100Tb) by using tools like Spark clusters, AWS S3 data storage and PostgreSQL.

Post-doctoral research scholar: 2016-2018, University of Chicago, Chicago, Illinois.

- Characterized extreme temperature events to an unprecedented level using novel statistical methodology and massive amounts of data leading to two publications in top-tier journals.

Data Scientist: Summer 2015, Tesla Motors, Palo Alto, California.

- Built out the platform for automating the Air-Conditioning and HVAC system by expanding the machine learning algorithm and predicting when people will drive leading to increased drive comfort.

President: Stanford Chapter of International Association for Mathematical Geoscience 09/10.

Papers, preprints and other research output

K. Penov, M. A. Haugen, D. Radakovic, K. Hamouda, A. Gorski R. Leyh, C. Bening Pulmonary Xenograft Matrix PplusN vs Cryopreserved Homograft for Ross procedure in adults, *in press, The Thoracic and Cardiovascular Surgeon, 2021*

M. A. Haugen, Michael L. Stein, and Elisabeth J. Moyer, Ryan L. Sriver, Future Climate Emulations Using Quantile Regressions on Large Ensembles, *Advances in Statistical Climatology, Meteorology and Oceanography (ASCMO)*, 2019

M. A. Haugen, Michael L. Stein, and Elisabeth J. Moyer, Ryan L. Sriver, Estimating Changes in Temperature Distributions in a Large Ensemble of Climate Simulations Using Quantile Regression, *Journal of Climate*, 2018

N. S. Diffenbaugh D. Singh J. S. Mankin D. E. Horton D. L. Swain, Danielle Touma, A. Charland, Y. Liua, M. Haugen, M. Tsiang, and B. Rajaratnama, Quantifying the influence of global warming on unprecedented extreme climate events, *Proceedings of the National Academy of Sciences*, 2017

M. Haugen, B. Rajaratnam, P. Switzer. Extracting Common Time Trends from Concurrent Time Series: Maximum Autocorrelation Factors with Application to Tree Ring Time Series Data. *http://arxiv.org/abs/1502.01073*, 2015.

D.L Swain, M. Tsiang, M. Haugen, D. Singh, A. Charland, B. Rajaratnam, and N.S. Diffenbaugh. The extraordinary California drought of 2013-2014: character, context, and the role of climate change. *Bulletin of the American Meteorological Society*- BAMS, 95(9):S3–S7, 2014.

D. Singh, D.E. Horton, M. Tsiang, M. Haugen, M. Ashfaq, A. Charland, N.C. Johnson, R. Mei, D. Rastogi, B. Rajaratnam, and N.S. Diffenbaugh. Severe precipitation in northern India in june 2013: causes, historical context, and changes in probability. *Bulletin of the American Meteorological Society*- BAMS, 95(9):S58–S61, 2014.

Haugen, M. Characterizing 2-dimensional electron gases in semiconductors *Physics Master's Thesis* 2011

Haugen, M. Exploring Direct Sampling and Iterative Spatial Resampling in History Matching, *Energy Resources Master's Thesis*

Research interests & specializations

Machine Learning, Statistics, Convex Optimization, Data Science, Geoscience, Graphical Models, Data Mining.

Research Experience

Statistics of Extreme Events:

Analyze geo-spatiotemporal data to characterize extreme events, e.g. heat-waves, tornadoes, heavy rainfall, including mapping the distributional shifts of the observables.

PhD Thesis topic:

Extracting time trends from concurrent time series non-parametrically and developing mathematical models under which signal-to-noise ratio is optimized.

Geo-statistical Analysis:

Co-authored two papers on climate dynamics cited in approximately 100 media outlets by providing statistical analysis, hypothesis testing, and uncertainty propagation.

Ultra-High dimensional regression:

Developed a package in the open source library of R implementing correlation screening for variables in an high-dimensional setting where the number of predictors grows unboundedly while the number of observations stay fixed, as an alternative to the LASSO algorithm.

Physics Master's thesis (Cambridge University):

Exploring scattering mechanisms in induced 2-dimensional electron gases by probing multiple chips at low-temperatures to measure electron density and Quantum Hall effects.

Teaching

Teaching Assistant: 2015, 2016 Winter, EESS 360/STATS 360: Advanced Statistical Methods for Earth System Analysis

Instructor: Summer 2008, Nesbru Senior High School (12th grade mathematics).

Programming Skills

Kubernetes, Python, Rust, Google/Azure Cloud serverless offerings, SQL, Postgres, R, Matlab, CSS, JavaScript

Honors & Awards

The William Whiteford Fellowship in Earth Sciences, Stanford University

The Edmund Wattis Littlefield Fellowship in Earth Sciences, Stanford University

Engineers in the Arts, Music scholarship, Stanford University

Science Award from Centre International De Valbonne as best graduating science student, France: 2004

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