Avinash N. Madavan

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EDUCATION

University of Illinois at Urbana-Champaign 2016 - 2022
M.S. in Electrical Engineering, 2018; Ph.D., 2022

University of California at San Diego 2012 - 2016
BS in Mechanical Engineering, Minor in Mathematics
Honors: Graduated *cum laude*, Phi Beta Kappa

WORK EXPERIENCE

Equinor January 2024 - April 2025
Dankse Commodities *Senior FTR Analyst*

- Designed and implemented a risk-aware portfolio optimization to provide an algorithmic bidding strategy.
- Developed statistical algorithms for model validation and verification.
- Evaluated and integrated model updates based on historical data and forecasts.

University of Illinois at Urbana-Champaign August 2016 - December 2022
Electrical and Computer Engineering, Power and Energy Group *Graduate Research Assistant*

- Research focused on online optimization for risk-sensitive convex optimization under uncertainty.
- Studied pricing mechanisms for transmission networks with uncertain component availability and wind.
- Derived convergence for a risk-sensitive primal-dual subgradient method with sampling complexity.
- Implemented open-source large-scale Benders' decompositon and critical region exploration algorithms for solving decomposed linear programs.
- Contributions were the basis of an NSF CAREER award.

PUBLICATIONS

- A. N. Madavan and S. Bose. A stochastic primal-dual method for optimization with conditional value at risk constraints. *Journal of Optimization Theory and Applications*, 190:428–460, 2021.
- A. N. Madavan, N. Dahlin, S. Bose, and L. Tong. Risk-based hosting capacity analysis in distribution systems. *IEEE Transactions on Power Systems*, 2023.
- A. N. Madavan, N. Dahlin, S. Bose, and L. Tong. Risk-sensitive security-constrained economic dispatch: Pricing and algorithm design. *IEEE Transactions on Power Systems*, 2023. (accepted).
- M. Ndrio, A. N. Madavan, and S. Bose. Conditional-value-at-risk-sensitive locational marginal pricing for electricity markets. In *2021 IEEE Power & Energy Society General Meeting*. IEEE, 2021.

PROJECTS

Stuka Linear programming algorithms for large-scale optimization, with implementations of Benders' decomposition, critical region exploration, and a predictor-corrector interior point method.

RSHC Risk-sensitive hosting capacity to determine feasibility of and maximal solar integration in distribution networks. Leverages duality to efficiently and scalably determine the set of feasible integrations.

SKILLS AND ACHEIVEMENTS

UIUC IEEE PES/PELS/IAS Chapter President May 2019-August 2020
IEEE PECI Conference Co-Director May 2019-May 2020

Core Knowledge Control Theory, Optimization Theory, Operations Research, Statistical Analysis, Large-Scaled Networked Optimization, Risk-Sensitive Optimization, Power Systems
Programming Languages Python, C/C++, Rust (sync), Java, MATLAB
Software Tools IPOPT, Gurobi, MOSEK, CPLEX, TensorFlow, Pandas, Powerworld