

ROBERT MIETH, PHD

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Education:

- 2021 **PhD, Electrical Engineering** (Dr.-Ing.), Technical University of Berlin, Germany, and New York University, USA
“*Risk-Aware Control, Dispatch and Coordination in Sustainable Power Systems*”
 - Awarded with highest honors (*summa cum laude*)
 - Advisors: Prof. J. Raisch, Control Systems Group, TU Berlin
Prof. Y. Dvorkin, Smart Energy Research Group, NYU
- 2017 **M.Sc., Industrial Engineering**, Technical University of Berlin
- 2017 **M.Sc., Electrical Engineering**, Technical University of Berlin
- 2013 **B.Sc., Industrial Engineering**, Technical University of Berlin

Appointments:

- since 2022 Postdoctoral Fellow, Princeton University, USA
- 2021 – 2022 Postdoctoral Researcher, New York University, USA
- 2018 – 2020 Visiting Scholar, New York University, USA
- 2017 – 2021 Research Associate, Technical University Berlin, Germany
- 2015 – 2017 R&D engineer, Solandeo GmbH, Berlin, Germany
- 2014 Research intern, Vattenfall AB, Stockholm, Sweden
- 2011 – 2015 Research and teaching assistant, Technical University Berlin, Germany

Honors and fellowships:

- 2022 Postdoctoral Fellowship, German Academy of Sciences Leopoldina
- 2019 INFORMS poster competition (finalist), INFORMS Annual Meeting, Seattle, USA
- 2018 – 2021 Full doctoral scholarship (~\$65k), Reiner Lemoine-Foundation, Berlin, Germany
- 2017 – 2018 Doctoral mobility scholarship (~\$10k), German Academic Exchange Service (DAAD)
- 2017 “Transformations of Energy Systems”-Grant (~\$3k), TU Berlin, Germany
- 2010 – 2017 Fellow of the German National Academic Foundation, Bonn, Germany (Alumnus since)
 - including full scholarship (~\$45k) and advanced educational programs

Teaching activities:

- 2019 & 2021 Junior trainer, Autumn School for Advanced Energy Modeling, TU Berlin
 - Workshop 2021: “*Data-driven Methods for Reliable Power System Operations*”
 - Workshop 2019: “*Stochastic Electricity Markets*”
- 2011 - 2015 Teaching assistant, TU Berlin
 - “*Electricity Sector Modeling (OR-III)*” (lecture, exercise), 2014 – 2015
 - “*Fundamental Scientific Methods*” (seminar) , 2013 – 2015
 - “*Introduction to Economics*” (exercise), 2011 – 2013

Mentoring experience:

- 2021 – 2022 Co-advisor to two Phd. students, New York University
 - Zhirui Liang: Guidance on Zhirui’s research on data-driven methods for stochastic electricity markets and power system reliability
 - Samrat Acharya: Guidance on Samrat’s reserach in data-driven optimization for cybersecurity applications
- 2019 – 2020 Master thesis supervision, Christoph Gerwin, TU Berlin
 - “*Modeling Framework and Compensation Mechanisms for Auction Based Electricity Pricing in Local Energy Markets*”
 - Acquisition of a DAAD PROMOS grant (~\$5k) to enable Christoph’s visit at NYU
 - Runner-up at 2020 GEE Best Thesis Award, Society for Energy Research and Policy
- 2019 & 2020 Co-Supervision of high school students during summer projects (ARISE program)
- 2017 Bachelor thesis co-supervision, Clemens Niewienda, TU Berlin
 - “*Design and construction of a fault simulator for a DFIG wind turbine testbed.*”

Advanced training:

- 2022 – 2023 Member of the ’22–’23 cohort of the “Program in Institutional and Historical Racism in Engineering, Technology, and Innovation”, Keller Center for Innovation in Engineering Education, Princeton University
- 2022 “Learning Mentoring”, The McGraw Center for Teaching and Learning, Princeton University
- 2019, 2021 Grid Science Winter School, Los Alamos National Laboratory
- 2013 Autumn School for Advanced Energy Modeling, TU Berlin
- 2012 International Summer School of Economics, Universidad Habana, Cuba and Humboldt University Berlin

Software contributions:

- since 2017 Power Market Tool (POMATO) with open-source access.

Service:

Journal reviewer: (since 2021) TOP–Journal of the Spanish Society of Statistics and Operations Research, (since 2020) IEEE Transactions on Sustainable Energy, Electric Power System Research Journal; (since 2019) IEEE Transaction on Smart Grid, IEEE Transactions on Power Systems, Power System Computation Conference, IEEE Transaction on Automatic Control; (since 2018) IEEE Transactions on Control of Network Systems

Committee memberships: (2022) External reviewer to the PhD dissertation of Adrian Esteban Perez on *Theory and Applications of Distributionally Robust Optimization with Side Data*, University of Malaga.

Consulting: (2015) Bavarian “Energy Dialog” for the Bavarian Ministry of Economy and Energy

Memberships in professional societies and associations:

- Since 2021 Member, IEEE Power & Energy Society
- Member, IEEE Control Systems Society
- Member, INFORMS
- 2017 – 2021 Student Member, IEEE Power & Energy Society
- Student Member, IEEE Control Systems Society
- Student Member, INFORMS
- Member, International Association of Energy Economists

Other voluntary work and leadership experience:

- since 2020 Contributor to “Scientists for Future International”, the international outreach platform of “Scientists for Future” (scientists4future.org/)
- 2018 Organization and fundraising (~\$30k) of a orchestra project to support cultural and musical education in Mauritius; In collaboration with the Opera Mauritius.

Peer-reviewed publications:

- (2022) Z. Liang, **R. Mieth**, and Y. Dvorkin, “Inertia pricing in stochastic electricity markets,” *IEEE Transactions on Power Systems*, 2021, accepted for publication
- (2022) S. Acharya, **R. Mieth**, R. Karri, and Y. Dvorkin, “False data injection attacks on data markets for electric vehicle charging stations,” *Advances in Applied Energy*, p. 100 098, 2022
- (2022) **R. Mieth**, Y. Dvorkin, and M. A. Ortega-Vazquez, “Risk-aware dimensioning and procurement of contingency reserve,” *IEEE Transactions on Power Systems*, 2022
- (2022) S. Eckstrom, G. Murphy, E. Ye, S. Acharya, **R. Mieth**, and Y. Dvorkin, “Outing power outages: Real-time and predictive socio-demographic analytics for new york city,” *IEEE PES General Meeting 2022*, 2022, to appear
- (2021) Z. Liang, **R. Mieth**, and Y. Dvorkin, “Operation adversarial scenario generation,” *2022 Power System Computation Conference*, 2022, to appear
- (2022) G. Peng, **R. Mieth**, D. Deka, and Y. Dvorkin, “Markovian decentralized ensemble control for demand response,” *IEEE Control Systems Letters*, 2022
- (2021) S. Acharya, **R. Mieth**, C. Konstantinou, R. Karri, and Y. Dvorkin, “Cyber insurance against cyber-attacks on electric vehicle charging stations,” *IEEE Transactions on Smart Grid*, 2021, to appear
- (2021) R. Weinhold and **R. Mieth**, “Power market tool (pomato) for the analysis of zonal electricity markets,” *SoftwareX*, vol. 16, p. 100 870, 2021
- (2021) **R. Mieth**, J. Kim, and Y. Dvorkin, “Risk-and variance-aware electricity pricing,” *Electric Power Systems Research*, vol. 189, p. 106 804, 2021
- (2020) **R. Mieth**, M. Roveto, and Y. Dvorkin, “Risk trading in a chance-constrained stochastic electricity market,” *IEEE Control Systems Letters*, vol. 5, no. 1, pp. 199–204, 2020
- (2020) R. Weinhold and **R. Mieth**, “Fast security-constrained optimal power flow through low-impact and redundancy screening,” *IEEE Transactions on Power Systems*, vol. 35, no. 6, pp. 4574–4584, 2020
- (2020) A. Hassan, **R. Mieth**, D. Deka, and Y. Dvorkin, “Stochastic and distributionally robust load ensemble control,” *IEEE Transactions on Power Systems*, vol. 35, no. 6, pp. 4678–4688, 2020
- (2020) J. Kim, **R. Mieth**, and Y. Dvorkin, “Computing a strategic decarbonization pathway: A chance-constrained equilibrium problem,” *IEEE Transactions on Power Systems*, vol. 36, no. 3, pp. 1910–1921, 2020
- (2020) M. Roveto, **R. Mieth**, and Y. Dvorkin, “Co-optimization of var and cvar for data-driven stochastic demand response auction,” *IEEE Control Systems Letters*, vol. 4, no. 4, pp. 940–945, 2020
- (2020) C. Gerwin, **R. Mieth**, and Y. Dvorkin, “Compensation mechanisms for double auctions in peer-to-peer local energy markets,” *Current Sustainable/Renewable Energy Reports*, pp. 1–11, 2020, open access at arxiv.org/pdf/2106.05999.pdf
- (2019) **R. Mieth** and Y. Dvorkin, “Distribution electricity pricing under uncertainty,” *IEEE Transactions on Power Systems*, vol. 35, no. 3, pp. 2325–2338, 2019
- (2019) **R. Mieth** and Y. Dvorkin, “Online learning for network constrained demand response pricing in distribution systems,” *IEEE Transactions on Smart Grid*, vol. 11, no. 3, pp. 2563–2575, 2019
- (2018) **R. Mieth** and Y. Dvorkin, “Data-driven distributionally robust optimal power flow for distribution systems,” *IEEE Control Systems Letters*, vol. 2, no. 3, pp. 363–368, 2018
- (2018) A. Hassan, **R. Mieth**, M. Chertkov, D. Deka, and Y. Dvorkin, “Optimal load ensemble control in chance-constrained optimal power flow,” *IEEE Transactions on Smart Grid*, vol. 10, no. 5, 2018
- (2018) M. Valikhani, **R. Mieth**, and U. Schäfer, “An overview of dfig ride through strategies under grid faults,” in *2018 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM)*, IEEE, 2018, pp. 931–937
- (2014) C. Lorenz, I. Schlecht, B. Reinhard, R. Weinhold, and **R. Mieth**, “Assessing inefficiencies on the german balancing market,” in *11th International Conference on the European Energy Market (EEM14)*, IEEE, 2014

Publications for broader audience with editorial review:

- (2021) **R. Mieth**, S. Acharya, A. Hassan, and Y. Dvorkin, “Learning-enabled residential demand response: Automation and security of cyberphysical demand response systems,” *IEEE Electrification Magazine*, vol. 9, no. 1, pp. 36–44, 2021
- (2015) **R. Mieth**, C. Gerbaulet, C. von Hirschhausen, C. Kemfert, F. Kunz, and R. Weinhold, *Perspektiven für sichere und umweltverträgliche Energieversorgung in Bayern*, 97. DIW Berlin: Politikber. kompakt, 2015
- (2015) **R. Mieth**, R. Weinhold, C. Gerbaulet, C. von Hirschhausen, and C. Kemfert, “Electricity grids and climate targets: New approaches to grid planning,” *DIW Economic Bulletin*, vol. 5, no. 6, pp. 75–80, 2015
- (2015) **R. Mieth**, R. Weinhold, and C. von Hirschhausen, *Neue prämissen für die netzplanung*, invited guest contribution. [Online]. Available: www.energie-klimaschutz.de/neue-praemissen-netzplanung/

Working papers:

- (2022) J. Zhang, A. Jiang, B. Newborn, S. Kou, and **R. Mieth**, “Quantifying electricity demand for 100% electrified transportation in new york city,” *IEEE PES General Meeting 2023*, 2022, under review
- (2022) Z. Liang, **R. Mieth**, Y. Dvorkin, and M. A. Ortega-Vazquez, “Weather-driven flexibility reserve procurement,” *IEEE Transactions on Power Systems*, 2022, under review
- (2021) R. Weinhold and **R. Mieth**, “Uncertainty-aware capacity allocation in flow-based market coupling,” *IEEE Transactions on Power Systems*, 2021, under review

Talks:

The asterisk (*) marks invited talks.

- (2022)* “Bad Data: Creating statistically consistent adversarial scenarios for power system decision making”, *Data Science Guild - Deep Dive Session*, E.ON Germany.
- (2021)* “Risk Hedging in Stochastic Electricity Markets”, *2021 INFORMS Annual Meeting*, Anaheim (+ Virtual), 2021.
- (2021)* “Risk-Aware Electricity Pricing”, *22nd Conference of the International Federation of Operational Research Societies (IFORS 2021)*, (Virtual), 2021.
- (2020) “Co-Optimization of VaR and CVaR for Data-Driven Stochastic Demand Response Auction”, *59th IEEE Conference on Decision and Control*, (Virtual), 2020.
- (2020) “Risk Trading in a Chance-Constrained Stochastic Electricity Market”, *59th IEEE Conference on Decision and Control*, (Virtual), 2020.
- (2020)* “Conic Programming for Convex Chance-Constrained Optimal Power Flow”, *2020 INFORMS Annual Meeting*, (Virtual), 2020.
- (2020) “Risk and Stochasticity in Electricity Markets”, *2020 INFORMS Annual Meeting*, (Virtual), 2020.
- (2020) “Risk- and Variance-Aware Electricity Pricing”, *XXI Power Systems Computation Conference (PSCC)*, (Virtual), 2020.
- (2019) “Distribution Electricity Pricing under Uncertainty”, *2019 INFORMS Annual Meeting*, Phoenix, 2019.
- (2019) “Risk- and Variance-Aware Electricity Pricing”, *2019 Transatlantic Infraday*, Washington, DC, 2019.
- (2018) “Data-Driven Distributionally Robust Optimal Power Flow for Distribution Systems”, *57th IEEE Conference on Decision and Control*, Miami Beach, 2018.
- (2018) “Online Learning for Network Constrained Demand Response Pricing under Uncertainty”, *2018 Transatlantic Infraday*, Washington, DC, 2018.
- (2018) “Power Market Model to Allow for Endogenous Flow-Based Market Coupling Analysis”, *41st IAEE International Conference*, Groningen, 2018.

Posters:

- (2021) “A Risk-Complete Electricity Market via Chance Constraints”, *2021 Los Alamos Grid Science School & Conference*, (Virtual), 2021.
- (2019) “Fast Security-Constrained Optimal Power Flow and Application in Flow Based Market Coupling”, *2019 INFORMS Annual Meeting*, Phoenix, 2019.
- (2019) “Distribution Locational Marginal Prices under Uncertainty”, *2019 INFORMS Annual Meeting*, Phoenix, 2019.
- (2019) “Distribution Locational Marginal Prices under Uncertainty”, *2019 IEEE Power & Energy Society General Meeting*, Atlanta, 2019.
- (2019) “Distributionally Robust OPF for Distribution Systems and Application in Demand Response Online Learning”, *2019 Los Alamos Grid Science School & Conference*, Santa Fe, 2019.