ROBERT MIETH, PHD

Postdoctoral Fellow, Princeton University, Princeton, NJ, USA

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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 Research Fellow, Princeton University, USA
2021 – 2022	Postdoctoral Researcher, Smart Energy Research Lab, New York University, USA
2018 – 2020	Visiting Scholar, Smart Energy Research Lab, New York University, USA
2017 – 2021	Research Associate, Control Systems Group, 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, Workgroup for Infrastructure Policy, TU Berlin, Germany

Honors and fellowships:

2022	Postdoctoral Fellow 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

Mentorship 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
- 2nd place 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 Mauritus; In collaboration with the Opera Mauritus.

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/`

Workin papers:

(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.