

Vladimir Dvorkin, Ph.D.

Postdoctoral Fellow at Massachusetts Institute of Technology

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EDUCATION	Technical University of Denmark (DTU)	Lyngby, Denmark
	PH.D. – ELECTRICAL ENGINEERING	09/2017 - 03/2021
	M.Sc. – SUSTAINABLE ENERGY	09/2015 - 07/2017
	SUPERVISORS: PROFS. PIERRE PINSON AND JALAL KAZEMPOUR	
	Higher School of Economics (HSE)	Moscow, Russia
	M.Sc. – ENERGY ECONOMICS	09/2012 - 06/2014
	Moscow Power Engineering Institute (MPEI)	Moscow, Russia
	B.E. – ELECTRICAL ENGINEERING	09/2008 - 06/2012

APPOINTMENTS & WORK EXPERIENCE	Massachusetts Institute of Technology	Cambridge, US
	MSCA–FIBE POSTDOCTORAL FELLOW	3/2022 - Present
	POSTDOCTORAL ASSOCIATE	2/2021 - 2/2022
	DEPARTMENT: LABORATORY FOR INFORMATION AND DECISION SYSTEMS & ENERGY INITIATIVE	
	Georgia Institute of Technology	Atlanta, USA
	Research Visitor	07/2019 - 12/2019
	DEPARTMENT: INDUSTRIAL & SYSTEMS ENGINEERING	
	Higher School of Economics	Moscow, Russia
	Research Assistant	12/2013 - 08/2017
	Khaznah Strategies Ltd	London, UK
	Consultant	05/2017 - 08/2017
	Power Engineering Group EOL	Moscow, Russia
	Engineering Intern	09/2011 - 11/2013

AWARDS	🏆 Marie Skłodowska-Curie Actions Postdoctoral Fellowship	03/2022–02/2024
	🏆 Best Paper Award, IEEE Transactions on Power Systems	2021
	🏆 Outstanding Reviewer Award, IEEE Transactions on Power Systems	2021
	🏆 LANL Grid Science Winter School Scholarship	2019
	🏆 Outstanding Reviewer Award, IEEE Transactions on Sustainable Energy	2018
	🏆 DTU Tuition Fee Waiver for MSc Students	08/2015–06/2017
	🏆 HSE Scholarship for Science Achievements	2014
	🏆 HSE Scholarship for Excellency	09/2012–06/2014
	🏆 Semifinalist at the Youth Russian Petroleum&Gas Case Championship	2013
🏆 MPEI Scholarship for Academic Achievements	09/2008–06/2012	

FUNDING	1. LearningORDER. (Individual postdoctoral fellowship, 03/2022-02/2024, \$200,000). Awarded by Marie Skłodowska-Curie Actions and Fundación Iberdrola España. Grant agreement No. 101034297. (Executive summary 📄, presentation 📄)
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PUBLICATIONS

SUBMITTED

- S1. **Dvorkin**, V. 2023. Agent coordination via contextual regression (AgentCONCUR) for data center flexibility. Submitted to *Power Systems Computation Conference* <https://doi.org/10.48550/arXiv.2309.16792>
- S2. Zhao D., Delikaraoglou S., **Dvorkin**, V., Botterud A., Lamadrid A., 2023. Optimizing bidding curves for renewable energy in two-settlement electricity markets. Submitted to *Power Systems Computation Conference*
- S3. Kenis M., **Dvorkin** V., Schittekatte T., Bruninx K., Delarue E., Botterud A., 2023. Evaluating offshore electricity market design considering endogenous infrastructure investments: Zonal or nodal? Submitted to *IEEE Transactions on Energy Markets, Policy and Regulation*
- S4. **Dvorkin**, V., Fioretto, N., Van Hentenryck, P., Kazempour, J. and Pinson, P., 2022. Privacy-preserving convex optimization: When differential privacy meets stochastic programming. Submitted to *Operations Research* (under 1st revision) <https://doi.org/10.48550/arXiv.2209.14152>

JOURNAL PUBLICATIONS

- J1. **Dvorkin**, V., Botterud, A. 2023. Differentially private algorithms for synthetic power system datasets. *IEEE Control Systems Letters*, vol. 7, pp. 2053-2058 <https://doi.org/10.1109/LCSYS.2023.3284389>
- J2. **Dvorkin**, V., Mallapragada, D. and Botterud, A., 2023. Multi-stage decision rules for power generation & storage investments with performance guarantees. *IEEE Transactions on Power Systems* (in print) <https://doi.org/10.1109/TPWRS.2023.3257129>
- J3. **Dvorkin**, V., Mallapragada, D., Botterud, A., Kazempour, J. and Pinson, P., 2022. Multi-stage linear decision rules for stochastic control of natural gas networks with linepack. *Electric Power Systems Research (XXII PSCC edition)*, 212, p.108388. <https://doi.org/10.1016/j.epsr.2022.108388>
- J4. **Dvorkin**, V., Ratha, A., Pinson, P. and Kazempour, J., 2021. Stochastic control and pricing for natural gas networks. *IEEE Transactions on Control of Network Systems*, 9(1), pp.450-462. <https://doi.org/10.1109/TCNS.2021.3112764>
- J5. **Dvorkin**, V., Fioretto, F., Van Hentenryck, P., Pinson, P. and Kazempour, J., 2021. Differentially private optimal power flow for distribution grids. *IEEE Transactions on Power Systems*, 36(3), pp.2186-2196.
 🏆 Best Paper Award for period 2019–2021
<https://doi.org/10.1109/TPWRS.2020.3031314>
- J6. **Dvorkin**, V., Kazempour, J. and Pinson, P., 2019. Electricity market equilibrium under information asymmetry. *Operations Research Letters*, 47(6), pp.521-526. <https://doi.org/10.1016/j.orl.2019.09.005>
- J7. **Dvorkin**, V., Delikaraoglou, S. and Morales, J.M., 2018. Setting reserve requirements to approximate the efficiency of the stochastic dispatch. *IEEE Transactions on Power Systems*, 34(2), pp.1524-1536. <https://doi.org/10.1109/TPWRS.2018.2878723>

CONFERENCE PUBLICATIONS

- C1. **Dvorkin**, V., Fioretto, F. 2023. Price-aware deep learning for electricity markets. *NeurIPS 2023 Workshop on Tackling Climate Change with Machine Learning* <https://doi.org/10.48550/arXiv.2308.01436>
- C2. **Dvorkin**, V., Chevalier, S., Chatzivasileiadis S., 2023. Emission-constrained optimization of gas networks: Input-convex neural network approach. In *2023 62th IEEE Conference on Decision and Control* (in print).
 🏆 Also selected for as a spotlight talk at 2023 ICLR-CCAI Workshop 🐦
<https://doi.org/10.48550/arXiv.2209.08645>

- C3. Zhao, D., **Dvorkin**, V., Delikaraoglou, S., Lamadrid, A. J., Botterud, A., 2023. A scalable bilevel framework for renewable energy scheduling. In *The 14th ACM International Conference on Future Energy Systems (e-Energy) 2023*
<https://doi.org/10.1145/3575813.3595199>
- C4. **Dvorkin**, V., Kazempour, J. and Pinson, P., 2020, August. Chance-constrained equilibrium in electricity markets with asymmetric forecasts. In *2020 International Conference on Probabilistic Methods Applied to Power Systems* (pp. 1-6). IEEE.
 🏆 Best Paper Award Nomination
<https://doi.org/10.1109/PMAFS47429.2020.9183423>
- C5. **Dvorkin**, V., Van Hentenryck, P., Kazempour, J. and Pinson, P., 2020, December. Differentially private distributed optimal power flow. In *2020 59th IEEE Conference on Decision and Control* (pp. 2092-2097). IEEE.
<https://doi.org/10.1109/CDC42340.2020.9303768>
- C6. Radoszynski, A.M., **Dvorkin**, V. and Pinson, P., 2019, June. Accommodating bounded rationality in pricing demand response. In *2019 IEEE Milan PowerTech (pp. 1-6)*. IEEE.
<https://doi.org/10.1109/PTC.2019.8810419>
- C7. **Dvorkin**, V., Kazempour, J., Baringo, L. and Pinson, P., 2018, December. A consensus-ADMM approach for strategic generation investment in electricity markets. In *2018 IEEE Conference on Decision and Control* (pp. 780-785). IEEE.
<https://doi.org/10.1109/CDC.2018.8619240>

THESIS

- T1. **Dvorkin**, V., 2021. Stochastic and private energy system optimization. *Ph.D. Thesis*. Technical University of Denmark. (Supervised by Pinson P., Kazempour J. Examined by Chatzivasileiadis, S., Shapiro, A., Wierman, A.)
https://drive.google.com/file/d/1_0wDZOnnH0tFnDeQ1S-eeW8QYoRJNRa4/view
- T2. **Dvorkin**, V., 2017. Multi-stage strategic investment in CCGTs and wind power units via progressive hedging. *M.Sc. Thesis*. Technical University of Denmark. (Supervised by Pinson P., Kazempour J. Examined by Boomsma, T.K.)
<https://drive.google.com/file/d/16MFeiUVbQ4IQ-d6wvUF9jZYUU-RHUCYa/view>

TEACHING TRAINING

1. MIT Kaufman Teaching Certificate Program (description [🔗](#)). Fall 2022.

TEACHING EXPERIENCE

1. *Renewables in Electricity Markets* DTU
 Head teaching assistant Spring 2020
 Teaching assistant Spring 2017
2. *DTU Summer School on Energy Optimization, Learning and Game Theory* DTU
 Teaching assistant Summer 2017–2019
3. *Advanced Optimization in Electricity Markets* DTU
 Teaching assistant Fall 2018
4. *Decomposition Techniques for Energy Systems Applications* Skoltech
 Teaching assistant, lecturer Fall 2018

SUPERVISION EXPERIENCE

1. Michiel Kenis, Toward off-shore bidding zones: the role of generation and transmission capacity investments. *Ph.D. student visitor*. Fall 2022, MIT.
2. Gretta Marija Nikkare, Co-optimization of green hydrogen and power system expansion planning. *M.Sc. thesis*. Spring 2022, MIT.
3. Rafal Michal Mikulowski, Power systems operation and planning using chance-constrained programming. *Coursework*. Fall 2019, DTU.

4. Andrea Marin Radoszynski, Demand response and bounded rationality in electricity markets. *M.Sc. thesis*. Spring 2018, DTU.
5. Eirini Ioanna Barmpati, Stochastic equilibrium models for capacity investment in energy systems. *Coursework*. Spring 2018, DTU.

SELECTED
INVITED TALKS

1. *Privacy-Preserving Optimization and Learning via Stochastic Optimization*
Georgia Institute of Technology (AI4OPT) March, 2023.
2. *Optimization and Learning in Energy Systems: Privacy and Performance*.
University of Michigan (ECE Department) May, 2023.
Massachusetts Institute of Technology (CEE Department) February, 2023.
University of Wisconsin–Madison (ECE Department) February, 2023.
University of Minnesota (ISyE Department) January, 2023.
University of Edinburgh (School of Mathematics) December, 2022.
3. *Differential privacy meets stochastic programming*.
Copenhagen University (Department of Computer Science).
Hosted by: YEVGENY SELDIN November, 2022.
4. *Performance guarantees for investments in power systems under uncertainty*.
Technical University of Denmark (DTU Management).
Presented at: SEMINAR ON ECONOMICS OF GREEN TRANSITION November, 2022.
5. *Privacy-preserving perturbation of convex optimization programs*.
California Institute of Technology.
Hosted by: ADAM WIERMAN and STEVEN LOW August, 2022.
6. *Privacy-preserving perturbation of convex optimization programs*.
Massachusetts Institute of Technology.
Presented at STATS&LIDS TEA TALKS seminar series May, 2022.
7. *Algorithmic privacy for energy system optimization*.
Massachusetts Institute of Technology.
Presented at MITEI RESEARCH MEETS seminar series May, 2022.
8. *Stochastic control and market design for natural gas networks*.
Massachusetts Institute of Technology.
Hosted by: AUDUN BOTTERUD September, 2020.
9. *Differentially private optimization of power systems*.
Georgia Institute of Technology.
Presented at DOS SEMINARS seminar series December, 2019.
10. *Electricity market equilibrium under information asymmetry*.
Johns Hopkins University.
Hosted by: BENJAMIN HOBBS January, 2019.

CONFERENCES
& WORKSHOPS

1. *Privacy-Preserving Synthetic Dataset Generation for Power Systems Research*
Federal Energy Regulatory Commission. July, 2023
2. *Emission-Constrained Optimization of Gas Systems with Input-Convex Neural Networks*
ICLR Workshop: Tackling Climate Change with Machine Learning May, 2023
3. *Privacy-preserving machine learning by means of stochastic optimization*.
2023 MLTea talks at MIT February, 2023
4. *Algorithmic privacy for energy systems optimization*.
2022 INFORMS Annual Meeting. October, 2022
5. *Multi-stage stochastic generation investment with performance guarantees*.
MITEI Future Energy Systems Center Fall 2021 Workshop. December, 2021

6. *Multi-stage investment decision rules for power systems: sensitivities, deterministic equivalents, and performance guarantees.*
2021 INFORMS Annual Meeting. October, 2021
7. *Multi-stage stochastic generation investment with performance guarantees.*
Federal Energy Regulatory Commission. June, 2021
8. *Differentially private optimal power flow for distribution grids.*
IEEE PES Madrid PowerTech 2021. June, 2021
9. *Stochastic control and market design for natural gas networks.*
2020 INFORMS Annual Meeting. October, 2020
10. *Differentially private optimal power flow for distribution grids.*
2020 INFORMS Annual Meeting. October, 2020
11. *Differentially private distributed optimal power flow.*
2019 GeorgiaTech Energy Systems and Optimization Workshop. November, 2019
12. *Electricity market equilibrium under information asymmetry.*
2019 INFORMS Annual Meeting. October, 2019
13. *Electricity market equilibrium under information asymmetry.*
2019 IEEE PES General Meeting. August, 2019
14. *Electricity market equilibrium under information asymmetry.*
XV International Conference on Stochastic Programming. August, 2019
15. *Power system optimization under information asymmetry.*
Grid Science Winter School, Los Alamos National Laboratory. January, 2019
16. *Consensus-ADMM approach for strategic investment in electricity markets.*
2018 IEEE Conference on Decision and Control. December, 2018
17. *A solution framework for strategic investment problems via progressive hedging.*
XV Conference on Computational Management Science. May, 2018

REVIEWER
EXPERIENCE

1. IEEE Transactions on Smart Grids since Apr 2019
 2. IEEE Transactions on Automatic Control since Jan 2019
 3. IEEE Transactions on Sustainable Energy since Jun 2018
 4. IEEE Transactions on Power Systems since Mar 2018
 5. Computational Management Science since Mar 2022
 6. European Journal of Operational Research since Jan 2020
 7. International Transactions on Electrical Energy Systems since Oct 2017
 8. PSCC – Power Systems Computation Conference 2018,2020,2022
 9. IEEE Conference on Decision and Control 2018 – 2023
 10. Smart Energy Systems and Technologies (SEST) 2020
 11. IEEE PES PowerTech 2019
 12. IEEE American Control Conference 2018
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GITHUB
REPOSITORIES

1. PrivateOpt: Differentially Private Convex Optimization [↗](#)
 2. InvestmentLDR: Investment Linear Decision Rules for Power Systems [↗](#)
 3. DP-CC-OPF: Differentially Private Chance-Constrained OPF [↗](#)
 4. GasLDR: Linear Decision Rules for Stochastic Control of Gas Networks [↗](#)
 5. Stochastic Control and Pricing for Natural Gas Networks [↗](#)
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PROFESSIONAL
MEMBERSHIPS

IEEE, Member (Power and Energy Society) since 2017
INFORMS, Member (Energy, Natural Resources and Environment section) since 2019.

OTHER

1. Founder of the ENOPTIMAL: ENERGY, OPTIMIZATION AND LEARNING [↗](#) seminar series at MIT to bridge energy researchers during the pandemic.