

Vladimir Dvorkin, Ph.D.

Postdoctoral Fellow at Massachusetts Institute of Technology

☎ +1 (347) 260 6789 📍 Cambridge, MA ✉ dvorkin@mit.edu 🌐 wdvorkin.github.io
🔍 Google Scholar 👤 wdvorkin 🐦 DvorkinVladimir

EDUCATION



- Technical University of Denmark (DTU)** **09/2017 - 03/2021**
PH.D. – ELECTRICAL ENGINEERING
Lyngby, Denmark
THESIS: STOCHASTIC AND PRIVATE ENERGY SYSTEM OPTIMIZATION [🔗](#)
SUPERVISORS: PROFS. PIERRE PINSON AND JALAL KAZEMPOUR
- Technical University of Denmark (DTU)** **09/2015 - 07/2017**
M.SC. – SUSTAINABLE ENERGY
Lyngby, Denmark
PRIMARIES: POWER SYSTEMS STABILITY & CONTROL, CONVEX OPTIMIZATION, DECISION-MAKING UNDER UNCERTAINTY, DECOMPOSITION TECHNIQUES, GAME THEORY, ENERGY ECONOMICS & POLICY
THESIS: STRATEGIC INVESTMENT IN CCGTs AND WIND POWER UNITS VIA PROGRESSIVE HEDGING [🔗](#)
SUPERVISORS: PROFS. PIERRE PINSON AND JALAL KAZEMPOUR
- Higher School of Economics (HSE)** **09/2012 - 06/2014**
M.SC. – ENERGY ECONOMICS
Moscow, Russia
PRIMARIES: MICROECONOMICS, FINANCE, FUNDAMENTALS OF ENERGY ECONOMICS, MANAGEMENT
- Moscow Power Engineering Institute (MPEI)** **09/2008 - 06/2012**
B.E. – ELECTRICAL ENGINEERING
Moscow, Russia
PRIMARIES: POWER SYSTEMS CONTROL, PLANNING & OPTIMIZATION
-

APPOINTMENTS & WORK EXPERIENCE

- Massachusetts Institute of Technology, Cambridge, US** **3/2022 - Present**
MSCA-FIBE POSTDOCTORAL FELLOW
PROJECT: LEARNING ORDER: OPERATIONALIZING DATA INTO ENERGY MANAGEMENT
DEPARTMENT: ENERGY INITIATIVE
- Massachusetts Institute of Technology, Cambridge, US** **2/2021 - 2/2022**
Postdoctoral Associate
DEVELOPING PLANNING OPTIMIZATION FOR ENERGY SYSTEMS OPERATIONS UNDER UNCERTAINTY
DEPARTMENT: LABORATORY FOR INFORMATION AND DECISION SYSTEMS & ENERGY INITIATIVE
- Georgia Institute of Technology, Atlanta, USA** **07/2019 - 12/2019**
Research Visitor
DIFFERENTIAL PRIVACY RESEARCH TOWARDS ETHICAL OPTIMIZATION OF ENERGY SYSTEMS
DEPARTMENT: H. MILTON STEWART SCHOOL OF INDUSTRIAL & SYSTEMS ENGINEERING
- Higher School of Economics, Moscow, Russia** **12/2013 - 08/2017**
Research Assistant
PROJECT WORK ON ELECTRICITY, GAS & HEAT PRICING
DEPARTMENT: INSTITUTE OF PRICING & REGULATION OF NATURAL MONOPOLIES
- Khaznah Strategies Ltd, London (remotely), UK** **05/2017 - 08/2017**
Consultant
ENERGY AND NATURAL RESOURCES PRICE FORECASTING, SOFTWARE ENGINEERING
- Power Engineering Group EOL, Moscow, Russia** **09/2011 - 11/2013**
Engineering Intern
DESIGNING HIGH-VOLTAGE CIRCUITS FOR CONSUMER ELECTRONICS
DEVELOPING THE HIGH-VOLTAGE DEVICES FOR MASS PRODUCTION.

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). Awarded by Marie Skłodowska-Curie Actions and Fundación Iberdrola España. Grant agreement No. 101034297. ([Executive summary](#) , [presentation](#) 

PUBLICATIONS

SUBMITTED

1. Dvorkin, V., Chevalier, S., Chatzivasilieiadis S., 2022. Emission-aware optimization of gas networks: Input-convex neural network approach. Submitted to *Workshop on Tackling Climate Change with Machine Learning at the Conference on Neural Information Processing Systems (NeurIPS) 2022*
<https://doi.org/10.48550/arXiv.2209.08645>
2. 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*
<https://doi.org/10.48550/arXiv.2209.14152>
3. Dvorkin, V., Mallapragada, D. and Botterud, A., 2022. Multi-stage investment decision rules for power systems with performance guarantees.
Submitted to *IEEE Transactions on Power Systems* (under 2nd revision)
<https://doi.org/10.48550/arXiv.2206.01675>
4. Zhao, D., Dvorkin, V., Delikaraoglou, S., Lamadrid, A. J., Botterud, A., 2022. Uncertainty-informed renewable energy scheduling: A scalable bilevel framework.
Submitted to *2023 IEEE Power & Energy Society General Meeting*

JOURNAL

PUBLICATIONS

1. 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>
2. 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>
3. 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>

4. 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>
5. 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
(PEER-REVIEWED)

1. 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/PMAAPS47429.2020.9183423>
2. 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>
3. 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>
4. 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

1. 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_0wDZ0nnH0tFnDeQ1S-eeW8QYoRjNRa4/view
2. 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. Greta 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. *Differential privacy meets stochastic programming.*
Copenhagen University (Department of Computer Science).
Hosted by: YEVGENY SELDIN November, 2022.
2. *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.
3. *Privacy-preserving perturbation of convex optimization programs.*
California Institute of Technology.
Hosted by: ADAM WIERMAN and STEVEN LOW August, 2022.
4. *Privacy-preserving perturbation of convex optimization programs.*
Massachusetts Institute of Technology.
Presented at STATS&LIDS TEA TALKS seminar series May, 2022.
5. *Algorithmic privacy for energy system optimization.*
Massachusetts Institute of Technology.
Presented at MITEI RESEARCH MEETS seminar series May, 2022.
6. *Stochastic control and market design for natural gas networks.*
Massachusetts Institute of Technology.
Hosted by: AUDUN BOTTERUD September, 2020.
7. *Differentially private optimization of power systems.*
Georgia Institute of Technology.
Presented at DOS SEMINARS seminar series December, 2019.
8. *Electricity market equilibrium under information asymmetry.*
Johns Hopkins University.
Hosted by: BENJAMIN HOBBS January, 2019.

CONFERENCES
& WORKSHOPS

1. *Algorithmic privacy for energy systems optimization.*
2022 INFORMS Annual Meeting. October, 2022
2. *Multi-stage stochastic generation investment with performance guarantees.*
MITEI Future Energy Systems Center Fall 2021 Workshop. December, 2021
3. *Multi-stage investment decision rules for power systems: sensitivities, deterministic equivalents, and performance guarantees.*
2021 INFORMS Annual Meeting. October, 2021
4. *Multi-stage stochastic generation investment with performance guarantees.*
Federal Energy Regulatory Commission. June, 2021
5. *Differentially private optimal power flow for distribution grids.*
IEEE PES Madrid PowerTech 2021. June, 2021

6. *Stochastic control and market design for natural gas networks.*
2020 INFORMS Annual Meeting. October, 2020
7. *Differentially private optimal power flow for distribution grids.*
2020 INFORMS Annual Meeting. October, 2020
8. *Differentially private distributed optimal power flow.*
2019 GeorgiaTech Energy Systems and Optimization Workshop. November, 2019
9. *Electricity market equilibrium under information asymmetry.*
2019 INFORMS Annual Meeting. October, 2019
10. *Electricity market equilibrium under information asymmetry.*
2019 IEEE PES General Meeting. August, 2019
11. *Electricity market equilibrium under information asymmetry.*
XV International Conference on Stochastic Programming. August, 2019
12. *Power system optimization under information asymmetry.*
Grid Science Winter School, Los Alamos National Laboratory. January, 2019
13. *Consensus-ADMM approach for strategic investment in electricity markets.*
2018 IEEE Conference on Decision and Control. December, 2018
14. *A solution framework for strategic investment problems via progressive hedging.*
XV Conference on Computational Management Science. May, 2018

REVIEWER EXPERIENCE	<ol style="list-style-type: none"> 1. IEEE Transactions on Smart Grids 2. IEEE Transactions on Automatic Control 3. IEEE Transactions on Sustainable Energy 4. IEEE Transactions on Power Systems 5. Computational Management Science 6. European Journal of Operational Research 7. International Transactions on Electrical Energy Systems 8. PSCC – Power Systems Computation Conference 9. IEEE Conference on Decision and Control 10. Smart Energy Systems and Technologies (SEST) 11. IEEE PES PowerTech 12. IEEE American Control Conference 	<p>since Apr 2019</p> <p>since Jan 2019</p> <p>since Jun 2018</p> <p>since Mar 2018</p> <p>since Mar 2022</p> <p>since Jan 2020</p> <p>since Oct 2017</p> <p>2018,2020,2022</p> <p>2018 – 2021</p> <p>2020</p> <p>2019</p> <p>2018</p>
------------------------	---	--

GITHUB REPOSITORIES	<ol style="list-style-type: none"> 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 ↗
------------------------	---

PROFESSIONAL MEMBERSHIPS	<p>IEEE, Member (Power and Energy Society) since 2017</p> <p>INFORMS, Member (Energy, Natural Resources and Environment section) since 2019.</p>
-----------------------------	--

OTHER	<ol style="list-style-type: none"> 1. Founder of the ENOPTIMAL: ENERGY, OPTIMIZATION AND LEARNING ↗ seminar series
-------	---