

CONTACT
INFORMATION

Computer Science and Public Policy
Hertie School
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Germany

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA, USA **2014–2019**

Ph.D., Engineering and Public Policy, May 2019

- Title: *Challenges and Prospects for Data-Driven Climate Change Mitigation*
- Thesis committee: M. Granger Morgan (chair), Jay Apt, Patrick McSharry, Inês Azevedo, Parth Vaishnav

M.S., Machine Learning, December 2018

- Secondary master's degree from the School of Computer Science

Freie Universität Berlin, Berlin, Germany **2007–2013**

M.S., Physics, September 2013

- Thesis title: *Crossover Behavior on Spatial Interdependent Complex Networks*
- Advisors: Felix von Oppen (FU Berlin), Rick Durrett (Duke University)

B.S., Physics, September 2010

- Minor in Economics

Duke University, Department of Physics, Durham, NC, USA **2011–2013**

Direct exchange program between Duke University and FU Berlin **2011–12**

Visiting scholar for master's thesis project **2012–13**

EMPLOYMENT
HISTORY

Hertie School, Data Science Lab, Berlin, Germany

Assistant Professor of Computer Science and Public Policy **8/2021–present**

ETH Zürich, Energy Technology and Policy Group, Zürich, Switzerland

Postdoctoral Researcher **4/2019–7/2021**

Lecturer **2/2020–7/2021**

Carnegie Mellon University, Department of Engineering and Public Policy, Pittsburgh, PA, USA

Postdoctoral Research Scientist **2/2019–4/2019**

Research Assistant **9/2014–2/2019**

United Nations University

Institute for the Advanced Study of Sustainability, Tokyo, Japan

Visiting Research Assistant **6/2017–8/2017**

Community Environmental Council, Santa Barbara, CA, USA

Volunteer Intern

4/2014–6/2014

Miller & Meier Consulting, Berlin, Germany

Intern

1/2014–3/2014

PUBLICATIONS

Kaack, L. H. (2021) Solar-panel detection goes global *Nature News & Views*. (Commentary, not peer-reviewed)

Milojevic-Dupont, N., Hans, N., **Kaack, L. H.**, Zumwald M., Andrieux, F., de Barros Soares, D., Lohrey, S., Pichler, P. P. & Creutzig, F. (2020) Learning from urban form to predict building heights. *PLOS ONE*, 15(12), p.e0242010.

Rolnick, D., Donti, P. L., **Kaack, L. H.***, Kochanski, K., Lacoste, A., Sankaran, K., Slavin Ross, A., Milojevic-Dupont, N., Jaques, N., Waldman-Brown, A., Luccioni, A., Maharaj, T., Sherwin, E. D., Mukkavilli, S. K., Kording, K. P., Gomes, C., Ng, A. Y., Hassabis, D., Platt, J. C., Creutzig, F., Chayes, J., & Bengio, Y. (2019) Tackling climate change with machine learning. arXiv:1906.05433 (Accepted by ACM Computing Surveys)

* Co-editor of full paper, section author of “Transportation” and “Buildings and Cities.”

Kaack, L. H., Chen, G. H., & Morgan, M. G. (2019) Truck traffic monitoring with satellite images. *ACM SIGCAS Conference on Computing and Sustainable Societies (COMPASS) (COMPASS '19)*, ACM, New York, NY, USA.

Kaack, L. H., Vaishnav, P., Morgan, M. G., Azevedo, I. L., & Rai, S. (2018) Decarbonizing intraregional freight systems with a focus on modal shift. *Environmental Research Letters*, 13(8), 083001.

Kaack, L. H., Apt, J., Morgan, M. G., & McSharry, P. (2017). Empirical prediction intervals improve energy forecasting. *Proceedings of the National Academy of Sciences*, 114(33), 8752-8757.

Kaack, L. H., & Katul, G. G. (2013). Fifty years to prove Malthus right. *Proceedings of the National Academy of Sciences*, 110(11), 4161-4162. (Commentary, not peer-reviewed)

PREPRINTS

Kaack, L. H., Donti, P., Strubell, E., Kamiya, G., Creutzig, F., & Rolnick, D. (2021). Aligning artificial intelligence with climate change mitigation. (In review at Nature Climate Change)

Friederich, D., **Kaack, L. H.**, Luccioni, A., & Steffen, B. (2021). Automated Identification of Climate Risk Disclosures in Annual Corporate Reports. arXiv preprint arXiv:2108.01415.

POLICY BRIEFS

Rolnick, D., Clutton-Brock, P., Donti, P. L., **Kaack, L. H.**, et al. (2021) Climate Change and AI: Recommendations for Government Action. Global Partnership on AI (GPAI) Report

Kaack, L. H., Donti, P. L., Strubell, E. & Rolnick, D. (2020) Artificial Intelligence and Climate Change: Opportunities, considerations, and policy levers to align AI with climate change goals. Heinrich Böll Stiftung Brussels, e-paper.

SCHOLARSHIPS
AND GRANTS

- Swiss National Science Foundation (SNF)** (with S. Sewerin)
Spark Grant, CHF 96,623 **12/2019**
- ETH Zurich Foundation**
Career Seed Grant, CHF 30,000 **12/2019**
- DigitalGlobe Foundation**
Satellite imagery grant **5/2018**
- Microsoft AI for Earth Azure Grant**
Computing credits on Azure cloud computing service **5/2018**
- Studienstiftung des deutschen Volkes**
(*German Academic Scholarship Foundation*)
- Full study scholarship for high achieving and proactive students **2007-2013**
 - Scholarship for two years of study in the U.S. (*Auslandsstipendium*) **2011-2013**
- Duke University Direct Exchange Program**
Tuition and living expenses for nine months of study abroad **9/2011-5/2012**

TEACHING
EXPERIENCE

- Faculty**, Hertie School
Artificial intelligence & climate change (graduate course) **Fall 2021**
- Lecturer**, ETH Zurich **2020-2021**
Policy Analysis I (graduate course), with T. Schmidt and B. Steffen **Fall 2020**
Policy Analysis I (graduate course), with T. Schmidt and B. Steffen **Fall 2019**
- Guest lectures**
- Several guest lectures, *Machine Learning Applied to Climate Change* (graduate course), McGill University, course instructor: D. Rolnick **Spring/2021**
 - “AI & Climate Change”, *Responsible AI* (undergraduate course), Johannes Kepler Universität Linz, course instructor: M. Mara **11/2020**
- Teaching assistant**
Undergraduate course: *Decision Making Methods for Engineering and Public Policy*, Carnegie Mellon University, course instructor: M. Small **Fall 2016**

LEADERSHIP
ROLES AND
RESPONSIBILITIES

- Co-founder and chair of **Climate Change AI** **Since 6/2019**
- \$1.8 million Innovation Grants program funded by Schmidt Futures and Quadrature Climate Foundation **2021**
 - Seven full-day conference workshops with peer-review process **2019-2021**
- Member of the Austrian Council on Robotics and Artificial Intelligence (ACRAI) **10/2020 - 10/2021**
- Scientific staff representative in the Department Conference of the Department of Humanities, Social and Political Sciences (D-GEISS) at ETH Zurich **11/2019 - 7/2021**

WORKSHOP AND
CONFERENCE
ORGANIZATION

- COP26 side event: “AI for Climate Action”, **lead organizer**, *UNFCCC Conference of the Parties (COP) 26, German Pavilion*, Glasgow, UK **11/2021**

Conference panel: “Text as Data: New Approaches and Empirical Applications for Analysing Policy and Legislative Texts,” *International Public Policy Association (ICPP5 - Barcelona 2021)*, Barcelona, Spain **7/2021**

Workshop: “Tackling climate change with machine learning,” *Thirty-fourth Neural Information Systems Processing (NeurIPS 2020)*, virtual event **12/2020**

Workshop: “Tackling climate change with machine learning,” *Ninth International Conference on Learning Representations (ICLR 2020)*, 5-day virtual event **4/2020**

Conference track: “AI & Climate Change,” **lead organizer**, *Applied Machine Learning Days (AMLD) 2020*, Lausanne, Switzerland **1/2020**

Workshop: “Tackling climate change with machine learning,” *Thirty-third Neural Information Systems Processing (NeurIPS 2019)*, Vancouver, BC, Canada **12/2019**

COP25 side event: “Artificial intelligence: Applications in climate mitigation and adaptation”, **lead organizer**, *UNFCCC Conference of the Parties (COP) 25, Chile Pavilion*, Madrid, Spain **12/2019**

Workshop: “Climate Change: How Can AI help”, co-organizer, *Thirty-sixth International Conference on Machine Learning (ICML 2019)*, Long Beach, CA, USA **6/2019**

Workshop: “Workshop on Strategies and Opportunities for Decarbonizing the World’s Freight System”, Carnegie Mellon University, Pittsburgh, PA, USA **2/2017**

INVITED TALKS
AND PANEL
DISCUSSIONS

European Parliament, Special Committee on Artificial Intelligence in a Digital Age, *Public hearing on AI and Green Deal* **1/2021**

Heinrich Böll Stiftung Brussels - European Union, *How Artificial Intelligence could help mitigate climate change*, briefing & e-paper presentation (virtual) **12/2020**

Digital-Gipfel 2020, Plattform Lernende Systeme, *KI für eine nachhaltige Gesellschaft* (virtual) **30/2020**

Bundestagsfraktion Bündnis 90/Die Grünen, Schwerpunktsitzung der AG Digitalpolitik, *Künstliche Intelligenz und Klimawandel* (virtual briefing) **11/2020**

Mercator Research Institute on Global Commons and Climate Change (MCC), Berlin, Germany, Research Seminar Series, *Leveraging computational text analysis for climate policy* (virtual) **10/2020**

Austrian Council on Robotics and Artificial Intelligence, *Discussion round: “AI for climate change mitigation and environmental protection”* (virtual) **10/2020**

Representation of the European Commission in Germany and Alexander von Humboldt Institut für Internet und Gesellschaft, Berlin, Germany, *Roundtable: Künstliche Intelligenz und Nachhaltigkeit - Klimafreundliche europäische KI?* **9/2020**

	Austrian Council on Robotics and Artificial Intelligence, <i>Ars Electronica 2020, AI x Ecology</i> (virtual)	9/2020
	Goethe Institut, Couch Lessons, <i>AI + Climate Change</i> (virtual)	6/2020
	Institute of Science and Technology (IST Austria), Young Scientist Symposium 2020, <i>Tackling Climate Change with Machine Learning</i> (virtual)	5/2020
	Clean Energy Leadership Institute (CELI), Oakland, USA, CELI Webinar, <i>Harnessing Artificial Intelligence to Fight Climate Change</i> (virtual)	4/2020
	Zürcher Hochschule für Angewandte Wissenschaften (ZHAW), ZHAW digital, Zurich, Switzerland, <i>Kann KI uns helfen, globale Herausforderungen zu meistern?</i>	3/2020
	UNFCCC Conference of the Parties (COP25), Chile Pavilion, Madrid, Spain, <i>AI for climate change policy</i>	12/2019
	Heinrich Böll Foundation, Transatlantic Networking Event: Policies for a just and green digital transformation, Berlin, Germany, <i>AI for climate change policy</i>	11/2019
	Institute for Atmospheric and Climate Science, ETH Zurich, Brown Bag Lunch Statistical Learning, Switzerland, <i>Tackling climate change with machine learning</i>	11/2019
	Computational Sustainability Network, CompSust Open Graduate Seminar, <i>Truck traffic monitoring with satellite images</i> (virtual)	1/2019
	U.S. Energy Information Administration, Energy Forecasting Forum, Washington D.C., USA, <i>An Application of Empirical Prediction Intervals to Energy Forecasting</i>	4/2016
WORKSHOP AND CONFERENCE PRESENTATIONS	“Uncovering policy designs from legal texts” Data for Policy 2020, 5th International Conference	9/2020
	“Uncovering policy designs from legal texts” Workshop on Institutional Grammar, Faculty of Political Science and International Studies, University of Warsaw (virtual)	6/2020
	“Truck traffic monitoring with satellite images” ACM SIGCAS Conference on Computing and Sustainable Societies (COMPASS), Accra, Ghana (virtual)	7/2019
	“Truck traffic monitoring with satellite images” Climate Change: How Can AI Help, Thirty-sixth International Conference on Machine Learning (ICML 2019), Long Beach, CA, USA	6/2019
	“Decarbonizing Global Freight Transportation with a Focus on Modal Shift.” 36 th USAEE/IAEE North American Conference, Washington, DC, USA	9/2018
	“Vehicle counting with deep convolutional neural networks for sustainable freight transportation.” Machine Learning in Science and Engineering (MSLE), Carnegie Mellon University, USA	6/2018

“Systemic Low-Carbon Energy Technologies”
Sustainable Energy Transitions Initiative (SETI) 2018 Spring Meeting, Duke University, USA **5/2018**

“Decarbonizing Global Freight Transportation with a Focus on Modal Shift.”
International Railway Symposium Aachen (IRSA), RWTH Aachen, Germany **11/2017**

“Intraregional Freight Transportation: Intermodal Freight Transport and Modal Shift.”
Workshop on Strategies and Opportunities for Decarbonizing the World’s Freight System, Carnegie Mellon University, USA **2/2017**

“An Application of Empirical Prediction Intervals to Energy Forecasting.”
TMP Graduate Consortium, University of Cambridge, United Kingdom **6/2016**

“The Applicability of Empirical Prediction Intervals to Energy Forecasting.”
39th IAEE International Conference, Bergen, Norway **6/2016**

“Introducing Probability into Energy Forecasting.” (poster),
33rd USAEE/IAEE North American Conference, Pittsburgh, PA, USA **10/2015**

EDITORIAL BOARD

Early Career Editorial Advisory Board (EAB) of Transportation Research part C **since 2021**

JOURNAL SERVICE Reviewer for *Nature*, *PNAS*, *Nature Sustainability*, *Energy Economics*, *Energy Research & Social Science*, *Patterns from Cell Press*, *Transportation Research Record*, *ICML*, *NeurIPS*, and *ICLR* workshops; and *International Joint Conference on Artificial Intelligence* special track.

FUNDING PROGRAMS

Lead organizer of the “Climate Change AI Innovation Grants Program” supported by the Quadrature Climate Foundation and Schmidt Futures **2021**

Evaluator at Vinnova for the call “AI in the service of climate”, agency of the Ministry of Enterprise and Innovation, Sweden **2020**

MEMBERSHIPS IN PROFESSIONAL ASSOCIATIONS PROGRAMMING SKILLS

Association for Computing Machinery (ACM)

R, Python, familiar with SQL, Matlab

LANGUAGES

German: Native
English: Full professional proficiency
Italian: Conversational
Japanese: Beginner