Dr. Konstantin Klemmer

Postdoctoral Researcher

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Education

Jul 2018 – Jun 2022	**Center for Urban Science + Progress, New York University, Brooklyn, USA** *Visiting PhD Student* • Research emphasis: Novel methods for identification of and learning from spatial patterns in urban data. • Supervision: Professor Daniel B. Neill
Oct 2017 – Jun 2022	**Department of Computer Science, University of Warwick, Coventry, UK** *PhD in Urban Science* • Dissertation: Improving Neural Networks for Geospatial Applications with Geographic Context Embeddings. • Supervision: Professor Stephen A. Jarvis, Professor Daniel B. Neill, Dr. Hongkai Wen
Nov 2020 – Apr 2021	**AI4EO Future Lab, Technical University of Munich & DLR, Munich, Germany** *Beyond Fellow* • Research emphasis: Geospatial machine learning and remote sensing for Earth observation. • Supervision: Professor Xiaoxiang Zhu
Oct 2018 – Sep 2019	**The Alan Turing Institute, London, UK** *Enrichment Student* • Research emphasis: Machine learning for urban analytics.
Oct 2016 – Sep 2017	**Imperial College London & University College London, London, UK** *MSc Transport & Business Management* • Dissertation: Isolating the effect of cycling on local business environments in cities (Grade: 74/100) • Overall Grade: 72/100 (Distinction)
Oct 2012 – Feb 2016	**University of Freiburg, Freiburg, Germany** *BSc Economics* • Dissertation: Exploring the spatio-temporal dynamics of carsharing utilization: A case study from Amsterdam (Grade: 1.0) • Overall Grade: 1.7 (Ranked 4th out of 74 in class)

Work Experience

Sep 2022 – Ongoing	**Microsoft Research New England, Cambridge, USA** *Postdoctoral Researcher* • Responsibilities: Two-year research fellowship as part of the "ML & Stats" postdoc program. • Manager: Dr. Nicolo Fusi
Jan 2022 – Jun 2022	**Department of Computer Science, University of Warwick, Coventry, UK** *EPSRC Mathematical Science Fellow* • Responsibilities: Continuation of research conducted throughout doctoral studies. • Manager: Dr. Hongkai Wen

Nov 2021 – Apr 2022	**Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Bonn, Germany**

Expert Consultant
- Responsibilities: AI expert consultant on the appraisal mission of the "Fair Forward" initiative, providing feedback on a large funding scheme for the use of AI in sustainability and development applications in low-income countries.

May 2016 – Dec 2019	**Geospin GmbH, Freiburg, Germany**

Student Fellow
- Responsibilities: Student fellow in a geospatial data analytics startup. Tasks included data science, social media strategy, market research and business development.
- Manager: Dr. Sebastian Wagner (CEO), Dr. Christoph Gebele

May 2014 – Sep 2016	**Chair of Economic Policy and Constitutional Economics, University of Freiburg, Freiburg, Germany**

Student Assistant
- Responsibilities: Research assistance (econometric modelling, data preparation), administration of the Chair's website and e-learning modules, event management.
- Manager: Professor Lars P. Feld

Feb 2013 – Apr 2016	**Chair of Information Systems Research , University of Freiburg, Freiburg, Germany**

Student Assistant
- Responsibilities: Research assistance (data preparation and statistical analysis, data visualization), administration of e-learning modules.
- Manager: Professor Dirk Neumann

Mar 2014 - May 2014	**Walter Eucken Institute, Freiburg, Germany**

Intern
- Responsibilities: Analysis of scientific articles, data processing, preparation of scientific presentations.
- Manager: Professor Lars P. Feld

Sep 2011 – Aug 2012	**EVBZ Care Center for People with Disabilities, Steinhöring, Germany**

Federal Voluntary Service
- Responsibilities: Assistance and care for multiply disabled people, carpool supervision, warehousing

Teaching Experience

Oct 2017 – Sep 2018	**Department of Computer Science, University of Warwick, Coventry, UK**

Teaching Assistant
- Classes: CS118 – Programming for Computer Scientists (Undergraduate), CS909 – Data Mining (postgraduate)

Mar 2013 – Apr 2016	**Chair of Information Systems Research, University of Freiburg, Freiburg, Germany**

Teaching Assistant
- Classes: Introduction to Information Systems (Undergraduate)
- Head instructor in the final year.

Volunteering & Mentoring

Aug 2020 – Ongoing	**Climate Change AI, Pittsburgh, USA** *Member of the Board of Directors & Chair of the Communications Committee* • Responsibilities: Leadership role in a fast-growing NGO at the intersection of climate change and artificial intelligence. Tasks include organizational oversight, social media, academic outreach and event organization.
Oct 2020 – Jan 2021 Oct 2019 – Jan 2020 Oct 2018 – Jan 2019	**Applied Machine Learning Days, Lausanne, Switzerland** *Co-organizer of the "AI & Cities" track* • Responsibilities: Organising full day conference tracks on the impacts of AI on urban living and governance.
Nov 2016 – Sep 2017	**Imperial College Data Science Society, London, USA** *Team Talent Development* • Responsibilities: Organising and teaching machine learning workshops in R and Python, arranging academic and industry talks, promoting data science and its social impacts.
Sep 2015 – Sep 2016	**Aktionskreis Freiburger Schule, Freiburg, Germany** *Honorary Staff Member* • Responsibilities: Public relations, social media, event management.
Oct 2014 – Mar 2015	**Mentoring Program of the Economics Department, University of Freiburg, Freiburg, Germany** *Mentor* • Responsibilities: Group supervision for first-semester undergraduate students.
Oct 2012 – Sep 2016	**Student's Union of the Economics Department, University of Freiburg, Freiburg, Germany** *Student Representative* • Responsibilities: Elected student representative in various committees such as faculty council or student parliament. Co-president of the Economics Student Union (Oct 2013 – Oct 2015).

Awards & Scholarships

Nov 2020 – Apr 2021	**Technical University of Munich & DLR, Munich, Germany** *Beyond Fellowship* • Value: €6,000, travel expenses
Oct 2018 – Sep 2019	**The Alan Turing Institute, London, UK** *Enrichment Student Scholarship* • Value: £5,000
Oct 2017 – Dec 2021	**Engineering and Physical Sciences Research Council, London, UK** *PhD Scholarship* • Value: Tuition fees
Oct 2017 – Dec 2021	**University of Warwick, Coventry, UK** *PhD Stipend* • Value: £14,553 pa., research allowance

Publications

2023   1.   **Klemmer, K.**, Safir, N. & Neill, D. B. Positional Encoder Graph Neural Networks for Geographic Data. *Proceedings of the International Conference on Artificial Intelligence and Statistics (AISTATS)* (2023).

2022   2.   Cunningham, T., **Klemmer, K.**, Wen, H. & Ferhatosmanoglu, H. GeoPointGAN: Synthetic Spatial Data with Local Label Differential Privacy. *submitted* (2022).

  3.   **Klemmer, K.**, Xu, T., Acciaio, B. & Neill, D. B. SPATE-GAN: Improved Generative Modeling of Dynamic Spatio-Temporal Patterns with an Autoregressive Embedding Loss. *Proceedings of the AAAI Conference on Artificial Intelligence* (2022).

  4.   Reiersen, G. *et al.* ReforesTree: A Dataset for Estimating Tropical Forest Carbon Stock with Deep Learning and Aerial Imagery. *Proceedings of the AAAI Conference on Artificial Intelligence* (2022).

2021   5.   **Klemmer, K.** & Neill, D. B. Auxiliary-task learning for geographic data with autoregressive embeddings. *Proceedings of the ACM International Symposium on Advances in Geographic Information Systems (SIGSPATIAL)* (2021).

  6.   **Klemmer, K.**, Neill, D. B. & Jarvis, S. A. Understanding spatial patterns in rape reporting delays. *Royal Society Open Science* (2021).

  7.   **Klemmer, K.**, Saha, S., Kahl, M., Xu, T. & Zhu, X. X. Generative modeling of spatio-temporal weather patterns with extreme event conditioning. *AI: Modeling Oceans and Climate Change (AIMOCC) Workshop, International Conference on Learning Representations (ICLR)* (2021).

  8.   Luo, M., Du, B., **Klemmer, K.**, Zhu, H. & Wen, H. Deployment Optimization for Shared e-Mobility Systems With Multi-Agent Deep Neural Search. *IEEE Transactions on Intelligent Transportation Systems* (2021).

2020   9.   **Klemmer, K.**, Yeboah, G., de Albuquerque, J. P. & Jarvis, S. A. Population Mapping in Informal Settlements with High-Resolution Satellite Imagery and Equitable Ground-Truth. *Machine Learning in Real Life (ML-IRL) Workshop, International Conference on Learning Representations (ICLR)* (2020).

  10.   Luo, M. *et al.* D3P: Data-driven Demand Prediction for Fast Expanding Electric Vehicle Sharing Systems. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* (2020).

2019   11.   **Klemmer, K.**, Koshiyama, A. & Flennerhag, S. Augmenting correlation structures in spatial data using deep generative models. *arXiv Preprint* (2019).

2018   12.   **Klemmer, K.**, Brandt, T. & Jarvis, S. Isolating the effect of cycling on local business environments in London. *PLOS ONE* (2018).

  13.   Munoz-Mendez, F., Han, K., **Klemmer, K.** & Jarvis, S. Community Structures, Interactions and Dynamics in London's Bicycle Sharing Network. *Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers (UbiComp)* (2018).

2017   14.   Willing, C., **Klemmer, K.**, Brandt, T. & Neumann, D. Moving in time and space – Location intelligence for carsharing decision support. *Decision Support Systems* (2017).

2016   15.   **Klemmer, K.**, Willing, C., Wagner, S. & Brandt, T. Explaining Spatio-Temporal Dynamics in Carsharing: A Case Study of Amsterdam. *AMCIS 2016 Proceedings* (2016).

Talks

- GISRUK 2017 – CDRC Data Challenge, Leicester, UK, April 2018 (contributed talk)
- Data Natives 2018, London, UK, April 2018 (contributed talk)
- WPCCS 2018, Coventry, UK, June 2018 (contributed talk)
- UbiComp 2018 – Workshop "Pervasive Urban Applications", Singapore, October 2018 (contributed talk)
- NeurIPS 2018 – Workshop on Modeling and decision-making in the spatiotemporal domain, Montreal, Canada,

December 2018 (contributed talk)
- A blueprint for urban analytics research, The Alan Turing Institute, Newcastle, UK, April 2019 (invited talk)
- ML4SEP Seminar, University of Zurich, Switzerland, January 2020 (invited talk)
- ICLR 2020 – Workshop "Machine Learning in Real Life" (ML-IRL), Addis Ababa, Ethiopia, April 2020 (contributed short talk)
- ICLR 2020 – Workshop "Climate Change AI" – Energy Day, Addis Ababa, Ethiopia, April 2020 (invited short talk)
- AI4EO seminar series, Munich, Germany, November 2020 (invited talk)
- AI4EO seminar series, Munich, Germany, July 2021 (invited talk)
- Royal Geographical Society – Annual Conference, London, UK, September 2021 (contributed talk)
- European Broadcasting Union – Green AI Micro-Workshop, virtual, March 2022 (invited talk)
- TUM.ai – Seminar series, Munich, Germany, July 2022 (invited talk)
- Harvard University – AI-Assisted Decision-Making for Conservation, Cambridge, USA, October 2022 (invited talk)
- University of Southern California – Frontiers of ML and AI, Los Angeles, USA, November 2022 (invited talk)
- TU Berlin – Climate Change & AI Berlin Brandenburg Workshop, virtual, November 2022 (invited talk)
- National Renewable Energy Laboratory – ALIS Seminar, virtual, January 2023 (invited talk)

Academic Services

Reviewing
- Journals: PLOS ONE, Public Transport – Planning and Operations, Computer Vision and Image Understanding, Environmental Data Science, Environment and Planning B, International Journal of Geographic Information Science, Annals of the American Association of Geographers
- Conferences: IEEE ITSC, WI, KDD, AAAI

Program Committee
- NeurIPS'19 Workshop "Machine Learning for the Developing World"
- ICLR'20 Workshop "Tackling Climate Change with Machine Learning"
- NeurIPS'20 Workshop "Tackling Climate Change with Machine Learning"
- ICLR'21 Workshop "Tackling Climate Change with Machine Learning"
- NeurIPS'21 Workshop "Tackling Climate Change with Machine Learning"
- NeurIPS'22 Workshop "Tackling Climate Change with Machine Learning"

Organization
- Applied Machine Learning Days – AI & Cities track, 2019–2021 (Co-organizer)
- ICLR'20 Workshop "Tackling Climate Change with Machine Learning" – Energy day (Co-organizer)
- NeurIPS'20 Workshop "Machine Learning for the Developing World" – Co-organizer and submissions chair
- NeurIPS'21 Workshop "Machine Learning for the Developing World" – Co-organizer and submissions chair
- ICLR'23 Workshop "Tackling Climate Change with Machine Learning" – Lead organizer

Mentoring

Undergraduate: Nathan Safir (University of Georgia)
Postgraduate: Gyri Reiersen (Technical University of Munich)

Languages

German (native language), English (fluent), French (advanced), Spanish (basic)

Software

Operating Systems: Windows OS, Linux OS
Statistics, Data Science & Machine Learning: R, Python (PyTorch), SPSS
Other: QGIS, Microsoft Office, LaTeX, PHP, PostgreSQL, HTML, CSS, PostGIS, Git, Docker