

# Rico Krueger

Assistant professor, DTU

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## Employment

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Assistant professor, Technical University of Denmark (DTU), Denmark, 02/2022–present.

Research and teaching associate (postdoc), Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, 11/2019–01/2022.

## Education

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PhD, Civil and Environmental Engineering, University of New South Wales (UNSW), Australia, 03/2016–09/2019. Degree awarded: 01/2020.

MSc, Industrial Engineering and Management, Technische Universität (TU) Berlin, Germany, 10/2013–02/2016.

BSc, Industrial Engineering and Management, Technische Universität (TU) Berlin, Germany, 10/2010–07/2013.

## Publications

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### Journal articles, refereed

- J19 Tabasi, M., Raei, A., Hillel, T., **Krueger, R.**, Rashidi, T. H. (2023): Empowering revealed preference survey with a supplementary stated preference survey: demonstration of willingness-to-pay estimation within a mode choice case. *Travel Behaviour and Society*, 33, 100632.
- J18 Arkoudi, I., **Krueger, R.**, Azevedo, C. L., Pereira, F. C. (2023): Combining Discrete Choice Models and Neural Networks through Embeddings: Formulation, Interpretability and Performance. *Transportation Research Part B: Methodological*, 175, 102783.
- J17 **Krueger, R.**, Bierlaire, M., Bansal, P. (2023): A Data Fusion Approach for Ride-sourcing Demand Estimation: A Discrete Choice Model with Sampling and Endogeneity Corrections. *Transportation Research Part C: Emerging Technologies*, 152, 104180.
- J16 **Krueger, R.**, Bierlaire, M., Gasos, T., Bansal, P. (2023): Robust discrete choice models with t-distributed kernel errors. *Statistics and Computing*, 33 (2).
- J15 Manser, P., Haering, T., Hillel, T., Pougala, J., **Krueger, R.**, Bierlaire, M. (2022): Estimating flexibility preferences to resolve temporal scheduling conflicts in activity-based modelling. *Transportation*.
- J14 **Krueger, R.**, Daziano, R. A. (2022): Stated choice analysis of preferences for COVID-19 vaccines using the Choquet integral. *Journal of Choice Modelling*, 45, 100385.
- J13 Bansal, P., Kessels, R., **Krueger, R.**, Graham, D. J. (2022): Preferences for using the London Underground during the COVID-19 pandemic. *Transportation Research Part A: Policy and Practice*, 160, 45-60.
- J12 **Krueger, R.**, Bierlaire, M., Daziano, R. A., Rashidi, T. H., Bansal, P. (2021): Evaluating the predictive abilities of mixed logit models with unobserved inter- and intra-individual heterogeneity. *Journal of Choice Modelling*, 41, 100323.
- J11 Bansal, P., Dua, R., **Krueger, R.**, Graham, D. J. (2021): Fuel Economy Valuation and Preferences of Indian Two-wheeler Buyers. *Journal of Cleaner Production*, 294, 126328.
- J10 Bansal, P., **Krueger, R.**, Graham, D. J. (2021): Fast Bayesian Estimation of Spatial Count Data Models. *Computational Statistics & Data Analysis*, 157, 107152.

- J9 **Krueger, R.**, Rashidi, T. H., Vij, A. (2020): X vs. Y: an analysis of intergenerational differences in transport mode use among young adults. *Transportation*, 47, 2203–2231.
- J8 **Krueger, R.**, Rashidi, T. H., Vij, A. (2020): A Dirichlet process mixture model of discrete choice: Comparisons and a case study on preferences for shared automated vehicles. *Journal of Choice Modelling*, 36, 100229.
- J7 **Krueger, R.**<sup>\*</sup>, Bansal, P.<sup>\*</sup>, Buddhavarapu, P. (2020): A New Spatial Count Data Model with Bayesian Additive Regression Trees for Accident Hot Spot Identification. *Accident Analysis & Prevention*, 144, 105623.
- J6 Bansal, P.<sup>\*</sup>, **Krueger, R.**<sup>\*</sup>, Bierlaire, M., Daziano, R. A., Rashidi, T. H. (2020): Bayesian Estimation of Mixed Multinomial Logit Models: Advances and Simulation-Based Evaluations. *Transportation Research Part B: Methodological*, 131, 124–142.
- J5 **Krueger, R.**, Rashidi, T. H., Dixit, V. V. (2019): Autonomous Driving and Residential Location Preferences: Evidence from a Stated Choice Survey. *Transportation Research Part C: Emerging Technologies*, 108, 255–268.
- J4 **Krueger, R.**, Rashidi, T. H., Auld, J. (2019): Preferences for travel-based multitasking: Evidence from a survey among public transit users in the Chicago metropolitan area. *Transportation Research Part F: Traffic Psychology and Behaviour*, 65, 334–343.
- J3 **Krueger, R.**, Vij, A., Rashidi, T. H. (2018): Normative beliefs and modality styles: a latent class and latent variable model of travel behaviour. *Transportation*, 45 (3), 789–825.
- J2 Vij, A., **Krueger, R.** (2017): Random taste heterogeneity in discrete choice models: Flexible nonparametric finite mixture distributions. *Transportation Research Part B: Methodological*, 106, 76–101.
- J1 **Krueger, R.**, Rashidi, T. H., Rose, J. M. (2016): Preferences for shared autonomous vehicles. *Transportation Research Part C: Emerging Technologies*, 69, 343–355.

## Book chapters

- BC3 Varotto, S. F.<sup>\*</sup>, **Krueger, R.**<sup>\*</sup>, Bierlaire, M. (in press): Modelling travel behaviour: A choice modelling perspective. In Potoglou, D., Spinney, J. (eds): *Handbook of Travel Behaviour*. Edward Elgar Publishing, Cheltenham, UK.
- BC2 Rodrigues, F., **Krueger, R.**, Pereira, F. C. (in press): Model building, inference and interpretation: Developing discrete choice models in the age of machine learning. In Hess, S., Daly, A. (eds): *Handbook of Choice Modelling*, 2nd edition.
- BC1 Bierlaire, M., **Krueger, R.** (in press): Sampling and discrete choice. In Hess, S., Daly, A. (eds): *Handbook of Choice Modelling*, 2nd edition.

## Invited talks

- IT3 **Krueger, R.**: Stated choice analysis of preferences for COVID-19 vaccines using the Choquet integral. Statistics and econometrics seminar, Faculty of Economics and Business, KU Leuven, Leuven, Belgium, 30 March 2023.
- IT2 **Krueger, R.**: Introduction to Bayesian inference. Research seminar, School of Engineering and IT, University of New South Wales, Canberra, Australia, 15 December 2021.
- IT1 **Krueger, R.**: Bayesian machine learning and spatial count data models: Advances in estimation and specification. Research seminar, Transport Division DTU Management, Technical University of Denmark, Lyngby, Denmark, 3 February 2021.

## Selected conference presentations

- C20 **Krueger, R.**, Bierlaire, M., Bansal, P.: Ride-sourcing demand estimation using discrete choice models: Accounting for sample selection and endogeneity biases. *16th International Conference on Travel Behaviour Research*, Santiago, Chile, 11–15 December 2022.
- C19 **Krueger, R.**, Daziano, R. A.: Stated choice analysis of preferences for COVID-19 vaccines using the Choquet integral. *International Choice Modelling Conference*, Reykjavik, Iceland, 23–25 May 2022.
- C18 **Krueger, R.**, Bierlaire, M., Gasos, T., Bansal, P.: Robust discrete choice models with t-distributed kernel errors. *International Choice Modelling Conference*, Reykjavik, Iceland, 23–25 May 2022.

- C17 Bansal, P., Kessels, R., **Krueger, R.**, Graham, D. J.: Changes in activity and travel behaviour of London Underground users during the COVID-19 pandemic. *ICMC Mini Online Event*, 28 May 2021.
- C16 **Krueger, R.**<sup>\*</sup>, Bansal, P.<sup>\*</sup>, Buddhavarapu, P.: A New Spatial Count Data Model with Bayesian Additive Regression Trees for Accident Hot Spot Identification. *9th Symposium of the European Association for Research in Transportation*, 3–4 February 2021.
- C15 **Krueger, R.**<sup>\*</sup>, Bansal, P.<sup>\*</sup>, Buddhavarapu, P.: A New Spatial Count Data Model with Bayesian Additive Regression Trees for Accident Hot Spot Identification. *2nd Bridging Transportation Researchers Online Conference*, 11–12 August 2020.
- C14 Bansal, P.<sup>\*</sup>, **Krueger, R.**<sup>\*</sup>, Bierlaire, M., Graham, D. J.: Variational Bayesian Inference for Spatial Negative Binomial Count Data Models with Unobserved Heterogeneity. *2nd Bridging Transportation Researchers Online Conference*, 11–12 August 2020.
- C13 Bansal, P.<sup>\*</sup>, **Krueger, R.**<sup>\*</sup>, Bierlaire, M., Graham, D. J.: Variational Bayesian Inference for Spatial Negative Binomial Count Data Models with Unobserved Heterogeneity. *Swiss Transport Research Conference*, Ascona, Switzerland, 13–14 May 2020.
- C12 Bansal, P.<sup>\*</sup>, **Krueger, R.**<sup>\*</sup>, Bierlaire, M., Daziano, R. A., Rashidi, T. H.: Bayesian Estimation of Mixed Multinomial Logit Models: Advances and Simulation-Based Evaluations. *International Choice Modelling Conference*, Kobe, Japan, 19–21 August 2019.
- C11 **Krueger, R.**, Bansal, P., Bierlaire, M., Daziano, R. A., Rashidi, T. H.: Variational Bayesian Inference for Mixed Logit Models with Unobserved Inter- and Intra-Individual Heterogeneity. *Swiss Transport Research Conference*, Ascona, Switzerland, 15–17 May 2019.
- C10 **Krueger, R.**, Rashidi, T. H., Vij, A.: X vs. Y: An Analysis of Inter-Generational Differences in Transport Mode Use Among Young Adults. *Transportation Research Board 98th Annual Meeting*, Washington DC, USA, 13–17 January 2019.
- C9 **Krueger, R.**, Rashidi, T. H., Dixit, V. V.: Autonomous Driving and Residential Location Preferences: Evidence from a Stated Choice Survey. *Transportation Research Board 98th Annual Meeting*, Washington DC, USA, 13–17 January 2019.
- C8 **Krueger, R.**, Rashidi, T. H., Auld, J.: Preferences for travel-based multitasking: Evidence from a survey among public transit users in the Chicago metropolitan area. *Transportation Research Board 98th Annual Meeting*, Washington DC, USA, 13–17 January 2019.
- C7 **Krueger, R.**, Vij, A., Rashidi, T. H.: A Dirichlet Process Mixture Model of Discrete Choice with an Application to Route Choice Preferences. *15th International Conference on Travel Behaviour Research*, Santa Barbara, USA, 15–20 July 2018.
- C6 **Krueger, R.**, Vij, A., Rashidi, T. H.: A Dirichlet Process Mixture Model of Discrete Choice. *Transportation Research Board 97th Annual Meeting*, Washington DC, USA, 7–11 January 2018.
- C5 **Krueger, R.**, Rashidi, T. H.: What Makes You Cycle this Far? An Analysis of Mandatory Bicycle Tour Distances. *Transportation Research Board 97th Annual Meeting*, Washington DC, USA, 7–11 January 2018.
- C4 **Krueger, R.**, Rashidi, T. H., Dixit, V. V.: Will Driverless Cars Induce Urban Sprawl? Experimental Design of a Stated Choice Study. *11th International Conference on Transport Survey Methods*, Montreal, Canada, 24–29 September 2017.
- C3 **Krueger, R.**, Rashidi, T. H., Vij, A.: Goal-Directed Transport Mode Use: A Structural Equation Modelling Perspective. *International Choice Modelling Conference*, Cape Town, South Africa, 3–5 April 2017.
- C2 **Krueger, R.**, Rashidi, T. H., Rose, J. M.: Adoption of Shared Autonomous Vehicles? A Hybrid Choice Modelling Approach based on a Stated Choice Survey. *Transportation Research Board 95th Annual Meeting*, Washington DC, USA, 10–14 January 2016.
- C1 **Krueger, R.**, Rashidi, T. H., Rose, J. M.: Identifying Potential Users of Smart Urban Mobility Services: Adoption of Shared Autonomous Vehicles: A Hybrid Choice Modelling Approach based on a Stated Choice Survey. *Workshop on Smart Urban Mobility*, hosted by Edinburgh Napier University, UK, 26–27 November 2015.

<sup>\*</sup> joint first authorship.

## Scholarships and awards

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DTU Visiting Scholar Program, joint application with Ricardo A. Daziano (Cornell University), 05–07/2023.

Conference participation abroad, Otto Mønsted Foundation, 05/2022.

Tuition Fee Scholarship and living allowance, granted by the University of New South Wales to support doctoral research, 2016–2019.

PROMOS scholarship of the German Academic Exchange Service (DAAD) for the support of a master thesis at the University of New South Wales (Sydney, Australia), 2015.

Study abroad scholarship of the Technische Universität Berlin for two exchange semesters (coursework) at the University of New South Wales (Sydney, Australia), 2014.

24th Congress Bundestag Youth Exchange Program (formerly Fulbright), high school student exchange to Eugene, Oregon, USA, 2007–2008.

## Grants

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Socially aware artificial intelligence for future transportation, DTU 2/3 PhD grant for an alliance research project, 08/2023–07/2026. Sponsor: DTU. Role: Principal investigator. Collaborators (DTU): Francisco C. Pereira, Danya Li. Partners: Yu Xiao (Aalto University), Xiang Su (Norwegian University of Science and Technology).

## Academic visits and exchanges

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Visiting scholar, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, 01/2019–06/2019. Supervisor: Prof Michel Bierlaire. Research topic: Variational Bayesian inference for discrete choice models.

Visiting scholar, University of New South Wales, Australia, 01/2015–05/2015. Supervisor: Dr Taha H. Rashidi. Research topic: Adoption of shared autonomous vehicles.

Coursework exchange, University of New South Wales, Australia, 02/2014–11/2014.

## Hosting of academic visitors

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Wencan Mao, Aalto University, Visiting PhD student, 01/10/2023–15/10/2023.

Mana Meskar, Sharif University of Technology, Visiting PhD student, 07/2023–12/2023.

Ricardo A. Daziano, Cornell University, Visiting Professor, with support from the DTU Management Visiting Scholar Program, 05/2023–07/2023.

## Teaching experience

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### Courses taught

Years	Course	Institution	Role	Learners
2023	Transport System Analysis – Demand and Planning	DTU	Course coordinator & lecturer	postgraduate students
2023, 2022	Model-based machine learning	DTU	Course coordinator & lecturer	postgraduate students
2023	Exploring the state-of-the-art in quantitative transport science (1 guest lecture)	DTU	Lecturer	PhD students
2023	Data and data science: Introduction to Bayesian statistics (1 guest lecture)	DTU	Lecturer	undergraduate students
2021, 2020	Optimization and simulation	EPFL	Course coordinator & lecturer	postgraduate students
2021	Discrete Choice Analysis: Predicting Individual Behavior and Market Demand	EPFL	Course coordinator & teaching assistant	academic & private sector
2021, 2020	Mathematical modeling of behavior	EPFL	Teaching assistant	postgraduate students
2020, 2019	Discrete Choice Analysis: Predicting Individual Behavior and Market Demand	EPFL	Teaching assistant	academic & private sector
2018	Urban Transport Planning Practice	UNSW	Teaching assistant	postgraduate students
2018	Transport Systems Part 1: Network Analysis	UNSW	Teaching assistant	postgraduate students
2018, 2016	Engineering Infrastructure Systems	UNSW	Teaching assistant	undergraduate students

### Teaching certifications

University Teacher Training Programme at DTU, comprehensive training in university teaching and learning with a particular focus on student-centred and learning outcome-based teaching in technology and engineering, estimated workload of 250 hours, 2022–2023.

### Supervision

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#### PhD

Danya Li: Socially-aware artificial intelligence for future transportation. DTU. Co-supervised with Francisco Pereira, Xiang Su and Xiao Yu. 08/2023–07/2026.

Alfredo Ojeda Diaz: Transport technology adoption: electric vehicle purchase motives and related behavioural and environmental effects. DTU. Co-supervised with Sonja Haustein and Anders Fjendbo Jensen. 12/2022–12/2025.

Ioanna Arkoudi: Embedding Representations for Discrete Choice and Travel Demand Models. DTU. Co-supervised with Francisco C. Pereira and Carlos Lima Azevedo. 02/2022–08/2023.

Cloe Cortes Balcells: Activity-based models and epidemics. EPFL. Co-supervised with Michel Bierlaire. 08/2021–09/2024.

## Master theses

Zsófia Könyves: Analysis of multi-year household travel diary data using dynamic topic models. DTU. Co-supervised with Jeppe Rich. 01/2023–06/2023

Grigorios Papaspyropoulos: Development of a decision support tool for predicting the performance of football players. DTU. Co-supervised with Francisco C. Pereira. 02/2022–07/2022.

Julien Harbulot: Transport mode classification with smartphone accelerometer data: An end-to-end deep learning approach. EPFL. Co-supervised with Michel Bierlaire. 02/2020–08/2020.

## Master semester projects

Hannah Gelblat, Mathias Nuris: Data pre-processing and epidemiological model building to predict infections with socio-economic variables. EPFL. Co-supervised with Michel Bierlaire and Cloe Cortes Balcells. 09/2021–01/2022.

Ambroise Favre: Matrix factorisation methods. Mines ParisTech, EPFL. Co-supervised with Michel Bierlaire. 03/2021–06/2021.

Antoine Crettenand: Designing a MATSIM environment to study the impact of SARS-CoV-2 in mobility. EPFL. Co-supervised with Michel Bierlaire and Cloe Cortes Balcells. 02/2021–06/2021.

Thomas Gasos: Bayesian analysis of multinomial discrete choice models with t-distributed kernel errors. EPFL. Co-supervised with Michel Bierlaire. 02/2020–06/2020.

## Project involvement

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Optimization of individual mobility plans to simulate future travel in Switzerland. Sponsor: Innosuisse (Swiss Innovation Agency). External partner: Swiss Federal Railways (SBB, Switzerland). Role: Co-investigator. 09/2020–01/2022.

OrgVisionPro: Automated organizational design and optimization. Sponsor: Innosuisse (Swiss Innovation Agency). External partner: Laurent Jaquenoud (CLEAP, Switzerland). Role: Project manager. 10/2019–06/2021.

Empirical Estimation of Time Use and Disutility of Travel Time in the Context of New Mobility Technologies. Sponsor: Argonne National Laboratory (USA). Role: Co-investigator. 04/2017–09/2018.

## Service

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### Reviewing activities

#### Journals

Accident Analysis & Prevention  
AStA Advances in Statistical Analysis  
IATSS Research  
IEEE Open Journal of Intelligent Transportation Systems  
International Journal of Sustainable Transportation  
International Journal of Transportation Science and Technology  
Journal of Choice Modelling  
Journal of Transport Geography  
Journal of Urban Planning and Development  
Metrika  
Nature Sustainability  
Networks and Spatial Econometrics  
Public Transport  
Research in Transportation Economics  
Scientific Reports

Technology in Society  
Transportation  
Transportation Letters  
Transportation Science  
Transportmetrica A  
Transport Policy  
Transportation Research Part A: Policy and Practice  
Transportation Research Part B: Methodological  
Transportation Research Part C: Emerging Technologies  
Transportation Research Part E: Logistics and Transportation Review  
Transportation Research Record  
Travel Behaviour and Society

### **Grants and research proposals**

National Science Foundation (NSF), USA. 25/02/2021–18/03/2021.

National Fund for Scientific and Technological Development (FONDECYT), Chile. 18/10/2018–09/11/2018.

### **Editorial activities**

Member of the Editorial Board, *Transportation Research Part A: Policy and Practice*. 08/2023–present.

Member of the Editorial Board, *Transportation Letters*. 02/2021–present.

### **Conference organisation and committee memberships**

Member of the Scientific Committee, *11th Triennial Symposium on Transportation Analysis (TRISTAN XI)*, Mauritius, 19–25 June 2022.

Workshop co-chair (with Zachary Patterson), *12th International Conference on Transport Survey Methods*, Portugal, 20–25 March 2022.

### **Computer and language skills**

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Python, Julia, R, MATLAB.

English (Full professional proficiency), German (native proficiency), French (limited working proficiency), Danish (basic).