

Marko Tešić

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Research Experience

- Royal Academy of Engineering UK IC Postdoctoral Research Fellow** at Birkbeck, University of London Mar. 2021 – Feb. 2023
- Exploring the effects that explanations of AI predictions can have on human beliefs
- Researcher** on *The Bayesian Approach to Robust Argumentation Machines* project at MCMP, LMU, Munich & Birkbeck, University of London Sep. 2021 – Feb. 2023
- Automated argument generation and evaluation from Bayesian network models
- Data Study Group (DSG) Principal Investigator** at the Alan Turing Institute Oct. 2022 – Present
- Scoping a data science challenge in collaboration with the data provider, the Department for Transport
 - Supporting DSG participants and acting as quality control on code and challenge solutions
 - Writing the final report on the outcomes of the data challenge to be published on the Turing website
- DSG Facilitator at AI UK showcase, the Alan Turing Institute** March 23, 2022
- Led a group of researchers in analyzing climate change data
- DSG Researcher at the Alan Turing Institute and LIDA, University of Leeds** July 5–23, 2021
- Optimizing Morrisons supermarkets' supply chain as part of a DSG team
 - Analyzed data & trained gradient boosting tree models to predict future supplies
- Research Intern at BlackRock, Factor Based Strategies Group** Oct. 2019 – Mar. 2020
- (Causal) Bayesian modeling of investment factors and ESG criteria
- Member of the Translation Team UK** on the project *Bayesian Argumentation via Delphi (BARD)* within IARPA at Birkbeck, University of London & UCL Oct. 2017 – Nov. 2018
- Created intelligence gathering-inspired situations
 - Built Bayesian network models of these situations
 - Fully designed, ran, and analyzed experiments testing people's evidential, causal, and probabilistic reasoning
- Member of the Research Team** on the project *Scientific Reasoning and Argumentation* at the Center for Advanced Studies, LMU, Munich Oct. 2016 – Sep. 2017
- Worked on explicating an inference pattern called 'Inference to the Best Explanation' (IBE) in Bayesian terms

Education

- Ph.D. in Psychology** 2020
Department of Psychological Sciences, Birkbeck, University of London, UK
Thesis title: *Explanation and Argument*
Areas of research: causal-probabilistic reasoning, Bayesian networks, psychology of explanations
Supervisors: Ulrike Hahn and David Lagnado
- M.A. in Logic and Philosophy of Science** 2016
Munich Center for Mathematical Philosophy, Ludwig Maximilian University, Munich, Germany
- B.A. in Philosophy** 2014
University of Belgrade, Serbia

Publications

Ulrike Hahn & **Marko Tešić** (in press). Argument and Explanation. *Philosophical Transactions of the Royal Society A*. Issue on *Cognitive Artificial Intelligence*.

Marko Tešić & Ulrike Hahn (2022). Can counterfactual explanations of AI systems' predictions skew lay users' causal intuitions about the world? If so, can we correct for that? *Patterns*, 3(12).

Data Study Group team. (2022). Data Study Group Final Report: Morrisons. Zenodo. <https://doi.org/10.5281/zenodo.6498140>.

Marko Tešić (2021). On the transferability of insights from the psychology of explanation to explainable AI. **Human Centered AI workshop at NeurIPS 2021**.

Marko Tešić & Ulrike Hahn (2021). **Explanation in AI systems**. In S. Muggleton & N. Chater (Eds.), *Human-Like Machine Intelligence* (pp. 114–136). Oxford University Press.

Marko Tešić*, Alice Liefgreen*, & David Lagnado (2020). **The propensity interpretation of probability and diagnostic split in explaining away**. *Cognitive Psychology*, 121.

Alice Liefgreen & **Marko Tešić** (2020). **Explaining away and the propensity interpretation of probability: The case of unequal priors**. In C. Dutilh Novaes, H. Jansen, J. A. van Laar, & B. Verheij (Eds.), *Reason to dissent. Proceedings of the 3rd European Conference on Argumentation, Vol. III* (pp. 385–403). College Publications.

Nicole Cruz, Saoirse Desai, Stephen Dewitt, Ulrike Hahn, David Lagnado, Alice Liefgreen, Kirsty Phillips, Toby Pilditch & **Marko Tešić** (2020). **Widening access to Bayesian problem solving**. *Frontiers in Psychology*, 11, 660.

Marko Tešić & Ulrike Hahn (2019). **Sequential diagnostic reasoning with independent causes**. In A.K. Goel, C.M. Seifert, & C. Freksa (Eds.), *Proceedings of the 41st Annual Conference of the Cognitive Science Society* (pp. 2947–2953). Montreal, QB: Cognitive Science Society.

Alice Liefgreen*, **Marko Tešić***, & David Lagnado (2018). **Explaining away: Significance of priors, diagnostic reasoning, and structural complexity**. In T. T. Rogers, M. Rau, X. Zhu, & C. W. Kalish (Eds.), *Proceedings of the 40th Annual Meeting of the Cognitive Science Society* (pp. 2047–2052). Austin, TX: Cognitive Science Society.

Marko Tešić (2017). **Confirmation and the generalized Nagel-Schaffner model of reduction: A Bayesian analysis**. *Synthese*, 196(3), 1097–1129. DOI: 10.1007/s11229-017-1501-1.

* indicates equal contribution

Work in Progress

Marko Tešić & Ulrike Hahn. **The impact of explanations as communicative acts on belief in a claim: The role of source reliability** (under review).

Marko Tešić, Ulrike Hahn, Jason Burton, & Kirsty Phillips. (Un)interesting correlations: What are the chances that correlations lead to causation? (in prep.).

Marko Tešić, Benjamin Eva, & Stephan Hartmann. **Confirmation by explanation: A Bayesian justification of IBE**.

Recent Presentations and Workshops

Can AI explanations skew our causal intuitions about the world? If so, can we correct for that?

- 8th Intelligence Community Academic Research Symposium (ICARS), USA September 14, 2022
- ONI National Intelligence Community Research Symposium, Canberra, Australia December 1, 2022

Workshop on Human Behavioral Aspects of (X)AI

- I organized a workshop bringing together cognitive scientist and machine learning researchers from academia, industry and government working on and with (explainable) AI. September 23–24, 2022

Teaching Experience

Visiting Lecturer for the M.A. courses <i>Computational Approaches to Mind and Fundamental Debates in Cognitive Science</i>	Jan. 2023 – Apr. 2023
Department of Psychological Sciences Birkbeck, University of London	
Taught: Bayesian modeling, Agent-based modeling, and Marr's levels of explanation	
Visiting Lecturer for the M.A. course <i>Cognitive and Economic Science of Rational Choice</i>	Oct. 2020 – Dec. 2020
Department of Psychology and Department of Economics City, University of London	
Taught: Rationality as logic and as probability theory, Probabilistic fallacies, and Causal reasoning and modeling	
Seminar leader for the M.A. courses <i>Neuroscience, Individual Differences, Social Psychology, and Developmental Psychology</i>	Feb., Nov. 2020; Feb. 2021
Department of Psychological Sciences Birkbeck, University of London, UK	
Tutor for the B.A. course <i>Logic and Discrete Structures</i>	Summer 2017
Computer Science Department Ludwig Maximilians University, Munich, Germany	
Teaching assistant for the M.A. course <i>Central Topics in Philosophy of Science</i>	Winter 2016
Munich Center for Mathematical Philosophy Ludwig Maximilians University, Munich, Germany	
Tutor for the B.A. course <i>Logic 1</i>	Winter 2016
Faculty of Philosophy Ludwig Maximilians University, Munich, Germany	

Honors and Awards

The Alan Turing Institute Post-Doctoral Enrichment Award	July 2022 – Jan. 2023
The Royal Academy of Engineering UK IC Postdoctoral Research Fellowship	Mar. 2021 – Present
Ph.D. studentship from the Department of Psychological Sciences, Birkbeck, UoL	2018 – 2020
Ph.D. studentship from the BARD project	2017 – 2018
Dositeja scholarship for graduate studies	2017/18; 2015/16; 2014/15
BAYHOST scholarship for graduate studies	2015/16; 2014/15

Skills

Software Skills:

- Text editing: \LaTeX
- Programming languages: R, Python, Matlab, NetLogo

Other:

- **Violinist** at **Paprika: The Balkan and East European Band** and **The Pico Players** (a symphony orchestra)
- **Xen-Do kickboxing**
- **Resident Advisor** at the University of London Halls of Residence (2019 – 2021)
 - Residents' welfare support
 - Academic assistance, peer-counseling
 - Emergency response (physical and mental first aid, fire emergency, Covid-19 related)

Online courses and further training:

- **Machine Learning** (Coursera)
- **Neural Networks and Deep Learning** (Coursera)
- **Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization** (Coursera)
- **Structuring Machine Learning Projects** (Coursera)
- **Convolutional Neural Networks** (Coursera)
- **Python Data Structures** (Coursera)
- **Science Policy Primer** (5-day course organized by The Royal Society, London, UK)
- **Business and Commercialization** (4-day course organized by The Royal Academy of Engineering, London, UK)
- **Media training** (full day course organized by The Royal Academy of Engineering, London, UK)