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** (2023). Argument and Explanation. *Philosophical Transactions of the Royal Society A*, 381. Theme 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?

- 8^{th} 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 *Computational Approaches to Mind* and *Fundamental Debates in Cognitive Science* — *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 *Cognitive and Economic Science of Rational Choice* — *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 *Neuroscience*, *Individual Differences*, *Social Psychology*, and *Developmental Psychology* — *Feb., Nov. 2020; Feb. 2021*

Department of Psychological Sciences
Birkbeck, University of London, UK

Tutor for the B.A. course *Logic and Discrete Structures* — *Summer 2017*

Computer Science Department
Ludwig Maximilians University, Munich, Germany

Teaching assistant for the M.A. course *Central Topics in Philosophy of Science* — *Winter 2016*

Munich Center for Mathematical Philosophy
Ludwig Maximilians University, Munich, Germany

Tutor for the B.A. course *Logic 1* — *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)
- Deep Learning (DeepLearning.AI on Coursera): Neural Networks and Deep Learning, Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization, Structuring Machine Learning Projects, Convolutional Neural Networks, Sequence Models.
- 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)