Marko Tešić

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Research Experience

Research Associate at Leverhulme Centre for the Future of Intelligence, University of Cambridge
July 2023 – Present
- Investigating AI capabilities and how these capabilities map onto the specific demands in the human workforce. Work done in collaboration with the OECD.

Royal Academy of Engineering UK IC Postdoctoral Research Fellow at Birkbeck, University of London
Mar. 2021 – Feb. 2023
- Exploring the effects of explanations of AI predictions 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 – April 2023
- 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*(2251). 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?

- 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   *September 23–24, 2022*
  researchers from academia, industry and government working on and with (explainable) AI.

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 – Feb. 2023*
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)