

# Marko Tešić

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## Research Experience

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- 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

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- 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

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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

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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

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

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| • 8 <sup>th</sup> 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

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| • 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 |
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## Teaching Experience

<b>Visiting Lecturer</b> 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	
<b>Taught:</b> Bayesian modeling, Agent-based modeling, and Marr's levels of explanation	
<b>Visiting Lecturer</b> 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	
<b>Taught:</b> Rationality as logic and as probability theory, Probabilistic fallacies, and Causal reasoning and modeling	
<b>Seminar leader</b> 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	
<b>Tutor</b> for the B.A. course <i>Logic and Discrete Structures</i>	Summer 2017
Computer Science Department Ludwig Maximilians University, Munich, Germany	
<b>Teaching assistant</b> 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	
<b>Tutor</b> for the B.A. course <i>Logic 1</i>	Winter 2016
Faculty of Philosophy Ludwig Maximilians University, Munich, Germany	

## Honors and Awards

<b>The Alan Turing Institute Post-Doctoral Enrichment Award</b>	July 2022 – Jan. 2023
<b>The Royal Academy of Engineering</b> 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
<b>Dositeja</b> scholarship for graduate studies	2017/18; 2015/16; 2014/15
<b>BAYHOST</b> scholarship for graduate studies	2015/16; 2014/15

## Skills

### Software Skills:

- Text editing:  $\text{\LaTeX}$
- 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)