

JACK MUMFORD

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RESEARCH INTERESTS

My research focuses on the challenge of advancing explainable AI systems that can provide rationales for their outputs. I am interested in building machine learning that is logically coherent and investigating the extent to which such learning can accommodate effective human-computer interaction in order to engender greater trust in the output. In particular I examine the intersection of neural networks (sub-symbolic) and argumentation semantics (symbolic), resulting in neural argumentation networks (NANs) that learn in a logically coherent manner according to argumentation principles.

EDUCATION

- 📅 2016 - 2017 MSc in Intelligent Systems
King's College London, Department of Informatics, UK
Distinction
- 📅 2012 - 2016 BSc in Mathematics
The Open University, School of Mathematics and Statistics, UK
1st Class (Honours)

RESEARCH

- 📅 2017 - PhD candidate in Computer Science
King's College London, Department of Informatics, UK
Thesis: Exploring the connections between argumentation and neural networks in producing data-driven decision making.
Supervisors: Professor Simon Parsons (School of Computer Science, University of Lincoln), Dr Elizabeth Black (Department of Informatics, KCL) and Dr Isabel Sassoon (Department of Computer Science, Brunel University London).

TEACHING EXPERIENCE

- 📅 2017 - Graduate Teaching Assistant
King's College London, Department of Informatics, UK
Taught small and large tutorial groups as well as computer lab practical sessions for undergraduate and masters level modules: Machine Learning; Data Mining; Software Measurement & Testing; Introduction to Robotics; Simulation & Data Visualisation.
Additional duties: coursework marking; moderation, invigilation and second marking of examinations.
- 📅 2014 - 2016 GCSE and A-Level Mathematics Tutor
West Midlands, UK
Provided private one-one tuition for secondary school students studying for examination at GCSE and A-Level mathematics.

AWARDS & GRANTS

- 📅 2019 Nominated for *King's Education Award* (KCL)
- 📅 2019 *Outstanding Teaching Assistant Award* (Dept. of Informatics, KCL)
- 📅 2017 - 2020 *PhD studentship* (EPSRC)
- 📅 2017 *Prize for the best overall performance on the MSc in Intelligent Systems* (Dept. of Informatics, KCL)

ACADEMIC SERVICE

- 📅 2019 - Online Handbook for Argumentation in Artificial Intelligence (OHAAI)
Co-Founder & Editor
- 📅 2019 - Argumentation Reading Group (King's College London)
Co-Founder & Member

OTHER SKILLS

Programming knowledge	Python, MATLAB, Processing, HTML, LaTeX.
Languages	English (fluent), French (intermediate), Spanish (intermediate).

SCIENTIFIC TALKS

- 📅 2020 • *Building Neural Argumentation Networks (NANs) - automating the learning of attack relationships from data.* Seminar for the Reasoning and Planning Group, Department of Informatics, King's College London, UK.

- 📅 2019 • *Building Neural Argumentation Networks (NANs) - automating the learning of attack relationships from data.* Presentation at the Argumentation Workshop, Imperial College London, UK.
- *Argumentation Machine Learning.* Seminar for the Argumentation Reading Group, King's College London, UK.
- *Attack learning using a feed-forward neural network.* Seminar for the Argumentation Reading Group, King's College London, UK.
- *Calculating Dung semantics attack-relations using a feed-forward neural network.* Presentation at the London Argumentation Forum, Imperial College London, UK.

PUBLICATIONS

1. J. Mumford, I. Sassoon, E. Black and S. Parsons. "Deriving argumentation framework attack-relations from data using a feed-forward neural network". Being prepared for submission to *Artificial Intelligence.*, expected submission date June 2020.
2. J. Mumford. "Crafting neural argumentation networks". Submitted to *Online Handbook of Argumentation for AI: OHAAI 2020.*
3. J. Mumford, I. Sassoon, E. Black and S. Parsons. "On the complexity of mapping attacks to argument acceptability data". Submitted to *Computational Models of Argument: Proceedings of COMMA 2020.*