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 (subsymbolic) 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". Accepted for publication in *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.*