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, King's College London) 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
Self-employed in providing private one-one tuition for secondary school students studying for examination at GCSE and A-Level mathematics. Developed tailored lesson plans, marked homework, provided learning goals and provided relevant feedback in order to develop the students' confidence in the subject and their own abilities.

PROFESSIONAL EXPERIENCE

📅 *2012 - 2014* Programme Co-ordinator/Operations Co-ordinator
University of Warwick, Warwick Business School, UK
I had responsibility for the successful administrative delivery of undergraduate modules (as Programme Co-ordinator) and distance learning masters-level content (later as Operations Co-ordinator). Both roles involved:
• Carefully monitoring student enquiries and providing timely responses by email, telephone and face-to-face • Supporting preparation and running of departmental open days • Analysing core statistics with Excel, Access and Outlook; and producing reports based upon departmental performance data.
The role of Operations Co-ordinator also required production of invoices for necessary materials. The role of Programme Co-ordinator also involved meeting with prospective students and their parents to explain and advocate the courses offered by the department.

📅 2010 - 2012 Customer Services Officer
HSBC Bank, Stratford-upon-Avon, UK
The role entailed driving the quantity of sales and the quality of service within a challenging target assessed team environment. Additionally I was accepted onto the internal fast track Promotion Scheme (Talent Pool). My duties included:
• Facilitating transactions from International Payments to more complex matters such as Personal Lending • Securing appointments and providing financial service via telephone • Auditing work and organisating branch procedural checks (following my promotion to act an authorised Signatory of the bank) • Flexibly supporting smaller branches of the bank, in various locations, in a supervisory role as and when required.

AWARDS & GRANTS

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

ACADEMIC SERVICE

📅 *2020 -* Department of Informatics TA Liaison Committee (King's College London)
TA Representative
📅 *2019 -* Online Handbook for Argumentation in Artificial Intelligence (OHAAI)
Co-Founder & Editor
📅 *2019 -* Argumentation Reading Group (King's College London)
Co-Founder & Member
📅 *2016 - 2017* Department of Informatics Postgraduate Staff Student Liaison Committee (King's College London)
Student Representative & Co-chair (*from 2017*)

OTHER SKILLS

Programming knowledge	Python, MATLAB, Java, 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

Published papers:

1. J. Mumford (2020). "Crafting neural argumentation networks". *Online Handbook of Argumentation for AI: Volume 1.* arXiv:2006.12020 [cs.AI].

Papers being prepared for submission:

2. 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 July 2020.

3. J. Mumford, I. Sassoon, E. Black and S. Parsons. "On the complexity of mapping attacks to argument acceptability data". Being prepared for submission to *Thirty-Fifth AAAI Conference on Artificial Intelligence*, expected submission date September 2020.

Edited books:

4. *Online Handbook of Argumentation for AI: Volume 1* (2020). arXiv:2006.12020 [cs.AI].