

# JACK MUMFORD

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## RESEARCH INTERESTS

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My research focuses on the challenge of advancing XAI 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

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- 📅 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

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- 📅 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

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- 📅 2017 - 2020 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

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- 📅 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 organising branch procedural checks (following my promotion to act as 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

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- 📅 2020 Recipient of *King's Education Award* (King's College London)
- 📅 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

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- 📅 2020 20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2021)  
**Additional reviewer**
- 📅 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

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| <b>Programming knowledge</b> | Python, MATLAB, Java, HTML, LaTeX.                               |
| <b>Languages</b>             | English (fluent), French (intermediate), Spanish (intermediate). |

## SCIENTIFIC TALKS

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- 📅 2021
  - *Complement-based argumentation*. Seminar for the UK India Education & Research Initiative (UKIERI).
- 📅 2020
  - *Learning attack relations from data - the abstract argumentation way*. Seminar for the UK India Education & Research Initiative (UKIERI).
  - *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

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### Published papers:

1. Jack Mumford. "Crafting neural argumentation networks". *Online Handbook of Argumentation for AI: Volume 1*, pages 22-26. arXiv:2006.12020 [cs.AI], 2020.

### Papers under review:

2. Jack Mumford, Isabel Sassoon, Elizabeth Black and Simon Parsons. "On the complexity of finding sigma consistent solution attack relations for complete argumentation semantics". Submitted to the *30th International Joint Conference on Artificial Intelligence (IJCAI-21)*.

### Papers being prepared for submission:

3. Jack Mumford, Isabel Sassoon, Elizabeth Black and Simon Parsons. "Deriving abstract argumentation attack relations from data using a feed-forward neural network". Being prepared for submission to *Artificial Intelligence*, expected submission date March 2020.

### Edited books:

4. Federico Castagna, Francesca Mosca, Jack Mumford, Stefan Sarkadi and Andreas Xydis (editors). *Online Handbook of Argumentation for AI: Volume 1*. arXiv:2006.12020 [cs.AI], 2020.