Lun Ai

Research Assistant @ Imperial College London
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Research Interests

- Inductive Logic Programming, Program Induction, Program Synthesis
- Machine Learning Comprehensibility, Explainable AI
- Systems Biology, Computational Scientific Discovery

Education

PhD, Computing Science, **Imperial College London, UK** 09/2019 - 12/04/2024

Thesis: Effects of Machine-Learned Logic Theories on Human Comprehension in Machine-Human Teaching

Methods: Program Synthesis, Inductive Logic Programming, Explainable AI

MEng, Computer Science (Artificial Intelligence), **Imperial College London, UK** 03/10/2015 - 28/06/2019

A-level, New Talent Academy, Beijing, China 09/2012 - 06/2015

Subjects: Physics(A*), Chemistry(A*), Further Mathematics(A*), Pure Mathematics(A+)

Employment

Research Associate, Imperial College London, UK

Project BBSRC AI-4-EB **(Current position)** 23/10/2022 -

Developed a Symbolic AI framework to actively learn gene functions in large metabolic networks

Methods: Inductive Logic Programming, Systems Biology

Project EU Horizon TAILOR 19/11/2020 - 22/10/2022

Created a framework for quantifying human comprehension of AI explanations

Methods: Inductive Logic Programming, Explainable AI

Research Support Officer, Imperial College London, UK

Network EPSRC Human-Like Computing 11/05 - 18/11/2020

Co-organised the 2nd International Joint Conference on Learning and Reasoning with partners from University of Edinburgh and University of Surrey

Software Engineer Intern, Schlumberger Technology Center, Norway 09/04 - 21/09/2018

Developed a backend ML application for analysing geographic data in the Google Cloud platform

Skills: Tensorflow, Pytorch, Google Cloud, Docker, Matlab, Python, C#, Kubernetes

Software Engineer Part-time, LV8Sports (startup), UK 05/11/2017 - 03/04/2018

Created a prototype of a mobile physical training assistant on the Android platform

Skills: OpenCV, Android, Java, C++

Software Engineer Intern, Yiwei Tech (startup), China 09/07 - 11/09/2016

Built a browser web service for mobile video streaming

Skills: HTML, Javascript, Java

Organisation

Organising Committee of the 2nd International Joint Conference on Learning and Reasoning, **IJCLR** 2022

Evidence of Esteem

Program Committee/Reviewer

The 39th International Conference on Logic Programming, **ICLP** 2023

The 45th Cognitive Science Society Conference, **CogSci** 2023

Machine Learning Journal, **MLJ** 2023

The 2nd International Joint Conference on Learning and Reasoning, **IJCLR** 2022

Awards

The Best Poster, Imperial College Poster Competition 2021

Overall Best Project, Microsoft 3Hack Hackathon Imperial College London 2017

Entry Scholarship, Imperial College London 2015

Publications

Journals

L. Ai, J. Langer, S. H. Muggleton and U. Schmid, "Explanatory machine learning for sequential human teaching," **Machine Learning**, 112:3591–3632, 2023. doi:10.1007/s10994-023-06351-8.

L. Ai, S. H. Muggleton, C. Hocquette, M. Gromowski and U. Schmid. "Beneficial and harmful explanatory machine learning," **Machine Learning**, 110:695-721, 2021. doi:10.1007/s10994-020-05941-0.

Pre-print

L. Ai, S.-S. Liang, W.-Z. Dai, L. Hallett, S. H. Muggleton, and G. S. Baldwin. "Human comprehensible active learning of genome-scale metabolic networks," **arXiv**, Aug. 2023. doi:10.48550/arXiv.2308.12740.

Oral presentations

Conferences

L. Ai, S.-S. Liang, S. H. Muggleton, and G. S. Baldwin, "A Comprehensible Framework to Active Learning Genome-Scale Metabolic Networks," **AAAI** Fall Symposium on AI for Synthetic Biology, Nov. 2023.

L. Ai, J. Langer, S. H. Muggleton and U. Schmid, "Explanatory machine learning for sequential human teaching," the 3rd International Joint Conference on Learning & Reasoning (**IJCLR**), Nov. 2023.

L. Ai, S.-S. Liang, W.-Z. Dai, L. Hallett, S. H. Muggleton, and G. S. Baldwin, "Human comprehensible active learning of genome-scale metabolic networks," **AAAI** Spring Symposium on Computational Approaches to Scientific Discovery, Mar. 2023.

L. Ai, S. H. Muggleton, C. Hocquette, M. Gromowski and U. Schmid, "Beneficial and harmful explanatory machine learning," the 1st International Joint Conference on Learning & Reasoning (**IJCLR**), Oct. 2021.

L. Ai, S. H. Muggleton, C. Hocquette, M. Gromowski and U. Schmid, "Beneficial and harmful explanatory machine learning," the Conference on Trustworthy AI Through The Integration Of Learning, Optimisation & Reasoning (**TAILOR**), Sep. 2021.

Other

L. Ai, "Explanatory machine learning for sequential human teaching," Imperial College London explAIn Technical Workshop on Explainable AI, Interactivity, and Natural Language, London, UK, Sep. 2023.

L. Ai, S.-S. Liang, W.-Z. Dai, L. Hallett, S. H. Muggleton, and G. S. Baldwin, "Active Learning of Genome-Scale Metabolic Networks via Abduction," Nanjing University AI Summer School, July 2023.

L. Ai, S.-S. Liang, S. H. Muggleton, and G. S. Baldwin,"AI-4-EB Network Engineering," AI-4-EB AI and Engineering Biology Consortium, London, UK, Apr. 2023.

L. Ai, S. H. Muggleton, "Effects of machine-learned logic theories on human comprehension," Imperial College London Explainable AI Seminar Series, London, UK, July. 2022.

L. Ai, S. H. Muggleton, C. Hocquette, M. Gromowski and U. Schmid, "Beneficial and harmful explanatory machine learning," the Dagstuhl Seminar on Approaches and Applications of Inductive Programming, May. 2021.