

ZHILIANG XIANG

Research Assitant at IROHMS | MSc Advanced Computer Science Student at Cardiff University

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EDUCATION

• M.Sc. in Advanced Computer Science

Cardiff University

Since Oct 2020

Cardiff, Wales

- Knowledge Representation Distinction
- Principles of Machine Learning (ML) Distinction
- Applications of ML (NLP) Distinction
- Programming Paradigms Distinction
- Automated Reasoning Additional

• B.Sc. in Information and Computation Science

Guangxi University of Science and Technology

Sept 2011 – Sept 2015

Guangxi, China

- Mathematics: Analysis, Algebra, Discrete Math, Probability, Statistics
- Programming: C++/Java Programming, Data Structure, DB Management
- Computation: Optimisation, Data Mining, Computational Intelligence

PUBLICATIONS

Proceedings

- Cohn, A. G., J. Hernández-Orallo, J. S. Mboli, Y. Moros-Daval, Z. Xiang, and L. Zhou (2022). "A Framework for Categorising AI Evaluation Instruments". In: *IJCAI2022 Workshop on AI Evaluation Beyond Metrics EBeM'22, July 24, 2022, Vienna, Austria*.
- Hu, Z., V. Gutiérrez-Basulto, Z. Xiang, X. Li, R. Li, and J. Z. Pan (2022). "Type-aware Embeddings for Multi-Hop Reasoning over Knowledge Graphs". In: *Proceedings of the Thirty-First International Joint Conference on Artificial Intelligence, IJCAI 2022, Vienna, Austria, 23-29 July 2022*. Ed. by L. D. Raedt. ijcai.org, pp. 3078–3084. DOI: 10.24963/ijcai.2022/427. URL: <https://doi.org/10.24963/ijcai.2022/427>.

RESEARCH PROJECTS

Declarative Entity Resolution via Answer Set Programming

Joint with the LaBRI, Université de Bordeaux

Ongoing

- Developing an Answer Set Programming (ASP) implementation of a declarative framework for collective entity resolution in relational databases
- Keywords: Data Cleaning, Entity Resolution, ASP, Reasoning under Constraints, Preference Relation in Logic Programming

Complex Query Answering with Knowledge Graph Embedding

Joint with the University of Edinburgh and Shanxi University

Ongoing

- Investigating query embeddings allowing to answer complex graph-like logical queries over incomplete knowledge graph

ABOUT ME

Having studied a major with strong mathematical background equipped me with **maturity in mathematics**, 5 years of industrial experience enhanced my **hands-on ability in programming**, being emphasised in AI modules during MSc study provided me with solid foundation in both **theoretical** and **practical** aspects of **AI**. I believe that establishing provable correspondences between **logical representations** (reasoning) and **neural models** (learning) could be an effective approach to address **human-level intelligence**, therefore I am keen to explore both **knowledge representation and reasoning** and **machine learning**, and their **integrations**, in particular, **Neuro-symbolic Reasoning**, **Logic Programming**, **Representation Learning** and **Knowledge-based NLP**.

PRACTICAL SKILLS

Answer Set Programming ●●●●●
Currently using in ER project, dissertation

Python ●●●●●
Main language currently in use

Java ●●●●●
Main language during 5 years of back-end engineering experience

Other Languages: proficient) C#, SQL, JS, (familiar) Haskell, Perl, (knowledge of) C++

Pytorch ●●●●●
Currently using

KerasTensorFlow ●●●●●
Used in projects done as coursework

Scikit-learn ●●●●●
Used in projects done as coursework

Other: Git, Unix systems, Shell, Docker, Jenkins, \LaTeX , relational databases, No-SQL, HPC server, Raspberry Pi

ACTIVITIES

- Presentation on "Type-aware Embeddings for Multi-Hop Reasoning over Knowledge Graphs" at the IJCAI-ECAI 2022
- Tutorial on "AI Approaches towards Data Cleaning" at the Escuela Superior Politécnica del Litoral
- EDBT-INTENDED Summer School 2022 (with Student Grant)
- Reasoning Web 2021 Summer School
- Cardiff KRR Research Group
- Cardiff NLP Research Group
- LoGaG Reading Group (Graph ML)

- Keywords: Knowledge Graph, Complex Query Answering, Query Embeddings, Representation Learning

OECD: AI and the Future of Skills

Joint with University of Leeds and Universitat Politècnica de València

📅 Preparing for submission

- Investigating existing competitions and benchmarks for evaluating artificial intelligence systems regarding capabilities and generality
- Keywords: Benchmarking, Evaluation, Artificial Intelligence Capabilities Measuring

Neuro-symbolic approaches for Abstract and Relational Visual Reasoning Tasks

Master Dissertation

- Proposing a prototype leverages the integration of Deep Neural Networks and Probabilistic Logic Programming to solve Raven Progressive Matrix
- Keywords: Neural Probabilistic Logic Programming, Disentangled Representation Learning and Multi-task Learning

RESEARCH/WORK EXPERIENCE

Research Assistant (Placement)

Centre for Artificial Intelligence, Robotics and Human-Machine Systems (IROHMS) | Cardiff University

📅 Nov 2021 - Now 📍 United Kingdom

- Conducting a research project regarding declarative framework for Entity Resolution task via Answer Set Programming under mentoring

Web GIS Development Engineer

Information Center of Nanning Bureau of Natural Resources

📅 Nov 2018 - Aug 2020 📍 China

- Lead a development project of a five-person team, assemble development plans and organise team tasks based upon web geographic information system (GIS) applications
- Design, implement, and maintain frameworks and functions for web GIS applications and web API

IT Product Manager

Shanghai Tongzhu Information Technology Co.,Ltd

📅 Mar 2017 - Nov 2018 📍 China

- Create assets to guide developments work (product requirement documents, user story mappings, stories for implementation etc.)
 - Perform generally technical support, such as system integration with cooperative partners or other service providers and user training
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