

Junhao Song

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As a Postgraduate Student at Imperial College London, United Kingdom, I have a strong background in multimodal data processing and am experienced in machine learning and mathematical benchmark optimisation. I am also currently the youngest Research Assistant in the Bio-Inspired Computing and Machine Learning (BCML) Lab at Heriot-Watt University, United Kingdom. I am currently researching Topic Modelling and Multimodal Learning in Natural Language Processing.

RESEARCH INTERESTS

Multimodal Learning, Computational Intelligence, Algorithms Optimisation

EDUCATION

Imperial College London (ICL), London, United Kingdom September 2023 — September 2024
Master of Science in Applied Computational Science and Engineering Grade: Pending

Heriot-Watt University (HWU), Edinburgh, United Kingdom September 2020 — June 2023
Bachelor of Science (Hons) in Computer Science (Artificial Intelligence) Grade: First Class Honours (Highest Distinction)

China Agricultural University (CAU), Beijing, China (Transferred to HWU) September 2019 — June 2020
Bachelor of Science in Computer Science Grade: A (Top 1%)

AWARDS

1st place at ACSE in “The Deep Impact” MSc Project November, 2023
Awarded by Imperial College London

1st place at HWU, 3rd place of Scotland in SICSA Programming Challenge January, 2023
Awarded by Scottish Informatics and Computer Science Alliance (SICSA)

1st place at HWU, 4th place of Scotland in SICSA Programming Challenge March, 2022
Awarded by Scottish Informatics and Computer Science Alliance (SICSA)

Scholarship For Excellence: Ranked in the Top 1% of the Department May, 2020
Awarded by China Agricultural University

PUBLICATIONS

Conference

- J. Song*, Y. Yuan*, and W. Pang†, “SAIS: A Novel Bio-Inspired Artificial Immune System Based on Symbiotic Paradigm,” *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO)*, July 2024.

Journal

- J. Song, Y. Yuan, K. Chang, B. Xu†, and W. Pang†, “Navigating Public Sentiment in the Circular Economy Through Multi-objective Optimised Topic Modelling,” *Elsevier Journal of Energy and AI*, May 2024. (Waiting for OA)

PROFESSIONAL EXPERIENCES

- Research Programmer (Research Assistant) for DCEE, June 2023 to Present
- Research Assistant at BCML Lab, September 2022 to Present
- Deep Learning Development Consultant Intern for Duotuo, August 2022 to November 2022
- Research Programmer (Research Assistant) for RAIInS, March 2022 to June 2022
- Website (Backend) Developer of UNV, August 2021 to October 2022
- Intern of RAIInS, April 2021 to September 2021
- Member of the HWU Algorithmic Competition Team, March 2021 to September 2022

PROJECTS

1. Navigating Public Sentiment in the Circular Economy through Topic Modelling

Duration: Jun 2023 - Sep 2023

Affiliation: Heriot-Watt University

Description: Employed natural language processing to analyze public opinions across multiple platforms, using dynamic

thematic modelling techniques, including an in-depth study of the dynamic BERTopic model.

Link: Project Poster

2. **Optimisation of Mathematical Benchmarks for Symbiosis-based Artificial Immune Systems**
Duration: Sep 2022 - May 2023
Affiliation: Heriot-Watt University
Description: Developed an innovative algorithm based on a symbiotic relationship artificial immune system, demonstrating excellent performance on complex optimisation problems.
Link: Project Poster
3. **Elemental Fury: Clash of the Titans**
Duration: Mar 2023 - Apr 2023
Affiliation: Heriot-Watt University
Description: A 3D card battle game that combines strategy and role-playing elements, developed using Unity3D and Blender for 3D models and animations.
Link: Game Video
4. **Heriot-Watt University International Graduate Student Analysis**
Duration: Mar 2023 - Apr 2023
Affiliation: Heriot-Watt University
Description: Explored trends in international postgraduate student growth, subject distribution, and accommodation at Heriot-Watt University using up-to-date datasets.
Link: Project Analysis
5. **COVID-19 Data Visualisation and Analytics**
Duration: Feb 2023 - Mar 2023
Affiliation: Heriot-Watt University
Description: An in-depth analysis and visualisation of COVID-19 outbreak data using d3.js, including a 3D Earth model to track the pandemic's changes.
Link: Data Visualisation
6. **Medieval Adventure - 2D Role Playing Game**
Duration: Jan 2023 - Mar 2023
Affiliation: Heriot-Watt University
Description: Revived interest in medieval exploration through strategic gameplay and compelling storyline, developed with Unity and designed using Photoshop and Adobe Illustrator.
Link: Game Video
7. **Artificial Universe Modelling - 100k Stars Challenge**
Duration: Dec 2022 - Jan 2023
Affiliation: Heriot-Watt University
Description: Improved a simulated universe model to include 100,000 stars, offering an interactive universe exploration experience through JavaScript technology.
Link: Universe Simulation
8. **Cloud Development Platform with Web Drive and Cloud Plug-in**
Duration: Nov 2022 - Dec 2022
Affiliation: Heriot-Watt University
Description: Through the platform, users can realise features such as document storage, collaborative editing, instant messaging and third-party service integration.
Link: Cloud Platform
9. **Indian Farmers E-commerce System**
Duration: Aug 2021 - Dec 2022
Affiliation: United Nations Volunteers
Description: Developed a marketplace for Indian farmers to sell their products directly to consumers, including payment, shipping, and internet marketing services.
Link: E-commerce System
10. **Pill Counter based on Mask-RCNN, OTSU, and Watershed Algorithms**
Duration: Aug 2022 - Dec 2022
Affiliation: Beijing DuoTuo Century Technology Co.
Description: Created an innovative pill counter using deep learning and image processing algorithms for accurate identification and counting of pills.
Link: Pill Counter
11. **UVS Farmers Marketplace**
Duration: Aug 2021 - Dec 2022
Affiliation: United Nations Volunteers
Description: An e-commerce platform connecting farmers with consumers, employing Django REST Framework, PHP, MySQL, Docker for development.
Link: Farmers Marketplace

12. **Web Browser based on C#**
Duration: Sep 2022 - Oct 2022
Affiliation: Heriot-Watt University
Description: Designed and implemented a web browser using C#, with features like HTTP request handling, history management, and a simple GUI.
Link: Web Browser
13. **DCEE Project Official Website**
Duration: Jun 2022 - Jul 2022
Affiliation: Heriot-Watt University
Description: Developed a website to promote the Digital Circular Electrochemical Economy project, showcasing interdisciplinary research across UK universities.
Link: DCEE Website
14. **Model Card for Face Recognition MS1M-ArcFace Dataset**
Duration: Mar 2022 - Jun 2022
Affiliation: Heriot-Watt University
Description: Implemented Tensorflow MobileFaceNet for face detection, optimized on various datasets without identifying demographics.
Link: Model Card
15. **The Mashup Design Platform "Elementum"**
Duration: Sep 2021 - Apr 2022
Affiliation: Heriot-Watt University
Description: A content sharing platform for collaboration and socializing, focusing on art sharing for large group design projects.
Link: Elementum Platform
16. **"Turing Eye" Start Page**
Duration: May 2021 - Sep 2021
Affiliation: China Agricultural University
Description: Developed the initial page of a search engine supporting multiple search services and personalized user settings.
Link: Turing Eye
17. **Machine Learning Analysis Platform (MLap) Development**
Duration: Apr 2021 - Sep 2021
Affiliation: The Engineering and Physical Sciences Research Council (EPSRC)
Description: Built a platform for data analysis and training, supporting visual analysis, regression, and classification analysis by MLFlow and Streamlit.
Link: MLap Platform
18. **2D Adventure Game "Ice and Fire"**
Duration: Sep 2020 - Dec 2020
Affiliation: Heriot-Watt University
Description: An infinite 2D adventure game with dynamic challenges and item-based progression, utilizing mouse controls for navigation and interaction.
Link: Game Video
19. **Telegram-based News Classification Bot**
Duration: Sep 2020 - Dec 2020
Affiliation: Heriot-Watt University
Description: Developed a bot to classify news on Telegram based on user preferences, comparing traditional news delivery with personalized news feeds.
Link: News Bot

SKILLS

- **Programming:** Python, C, C++, Java, R
- **Software:** Vim, Conda, Jupyter, CUDA, Git, Emacs
- **Soft Skills:** Pytorch, Tensorflow, BERT, Scikit-Learn, MXNet, ONNX, L^AT_EX