Hang Li

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Personal Profile

I am currently a Postdoctoral Research Officer at the **Information Engineering Lab (IELab)** in the **School of Electrical Engineering and Computer Science**, (CSRankings 2025 **17th** around the world and **4th** in Australia) at the **University of Queensland**, Queensland, Australia. During my PhD, I was working with **Prof. Guido Zuccon** (Principal Supervisor) and **A/Prof. Bevan Koopman** (Second Supervisor). My research interest focuses on Artificial Intelligence, Information Retrieval (IR), Retrieval Augmented Generation (RAG), Machine Learning, Natural Language Processing (NLP) and Large Language Models (LLMs).

Education

University of Queensland *Queensland, Australia*

Ph.D. in Computing Science *April 2020 - February 2026*

- Research Areas: Information Retrieval, Machine Learning, Artificial Intelligence, Large Language Models, Agentic AI, RAG, Conversational Search, Question Answering.
- Supported by the Grain Research and Development Corporation project AgAsk (UOQ2003-009RTX).
- Thesis: *Advanced Query Representation and Feedback Methods for Neural Information Retrieval*

University of Minnesota, Twin-Cities *Minneapolis, United States*

B.Sc. in Computer Science *September 2012 - July 2016*

- Global Excellence Scholarship (2012–2016)
- Coursework: Algorithms, Artificial Intelligence, Machine Learning, Database Systems, Operating Systems, Internet Programming

Publications

Journal Articles

AgAsk: An Agent to Help Answer Farmer's Questions from Scientific Documents
Bevan Koopman, Ahmed Mourad, Hang Li, Anton van der Vegt, Shengyao Zhuang, Simon Gibson, Yash Dang, David Lawrence, Guido Zuccon
International Journal on Digital Libraries 25.4 (2024) pp. 569–584. Springer, 2024

Pseudo Relevance Feedback with Deep Language Models and Dense Retrievers: Successes and Pitfalls
Hang Li, Ahmed Mourad, Shengyao Zhuang, Bevan Koopman, Guido Zuccon
ACM Transactions on Information Systems 41.3 (2023) pp. 1–40. ACM New York, NY, 2023

Design and Research of Intelligent Question-Answering (Q&A) System Based on High School Course Knowledge Graph
Zhijun Yang, Yang Wang, Jianhou Gan, Hang Li, Ning Lei
Mobile Networks and Applications (2021) pp. 1–7. Springer, 2021

Conference Proceedings

Evaluator - Rapid, Agile Development and Evaluation of Retrieval Augmented Generation Systems Without Labels
Bevan Koopman, Hang Li, Shuai Wang, Guido Zuccon
Proceedings of the 46rd European Conference on Information Retrieval (ECIR 2026), 2026

AgAsk: An Agent to Help Answer Farmer's Questions from Scientific Documents
Bevan Koopman, Ahmed Mourad, Hang Li, Anton van der Vegt, Shengyao Zhuang, Simon Gibson, Yash Dang, David Lawrence, Guido Zuccon
International Journal on Digital Libraries 25.4 (2024) pp. 569–584. Springer, 2024

Mesh Suggester: A Library and System for MeSH Term Suggestion for Systematic Review Boolean Query Construction
Shuai Wang, Hang Li, Guido Zuccon
Proceedings of the 16th ACM International Conference on Web Search and Data Mining, 2023

How Does Feedback Signal Quality Impact Effectiveness of Pseudo Relevance Feedback for Passage Retrieval
Hang Li, Ahmed Mourad, Bevan Koopman, Guido Zuccon
Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval, 2022

To Interpolate or Not to Interpolate: PRF, Dense and Sparse Retrievers
Hang Li, Shuai Wang, Shengyao Zhuang, Ahmed Mourad, Xueguang Ma, Jimmy Lin, Guido Zuccon
Proceedings of the 45th international ACM SIGIR conference on research and development in information retrieval, 2022

Pseudo-Relevance Feedback with Dense Retrievers in Pyserini
Hang Li, Shengyao Zhuang, Xueguang Ma, Jimmy Lin, Guido Zuccon
Proceedings of the 26th Australasian Document Computing Symposium, 2022

Improving Query Representations for Dense Retrieval with Pseudo Relevance Feedback: A Reproducibility Study
Hang Li, Shengyao Zhuang, Ahmed Mourad, Xueguang Ma, Jimmy Lin, Guido Zuccon
Proceedings of the 44th European Conference on Information Retrieval, 2022

Implicit Feedback for Dense Passage Retrieval: A Counterfactual Approach
Shengyao Zhuang, Hang Li, Guido Zuccon
Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval, 2022

MeSH Term Suggestion for Systematic Review Literature Search
Shuai Wang, Hang Li, Harrisen Scells, Daniel Locke, Guido Zuccon
Proceedings of the 25th Australasian Document Computing Symposium, 2021

Deep Query Likelihood Model for Information Retrieval
Shengyao Zhuang, Hang Li, Guido Zuccon
Proceedings of the 43rd European Conference on Information Retrieval, 2021

Systematic Review Automation Tools for End-to-End Query Formulation
Hang Li, Harrisen Scells, Guido Zuccon
Proceedings of the 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval, 2020

TREC Participants

IELAB for TREC Conversational Assistance Track (CAsT) 2020
Sebastian Cross, Hang Li, Arvin Zhuang, Mourad Ahmed, Koopman Bevan, Zuccon Guido
Proceedings of the 2020 TREC Conversational Assistance Track, 2020

IELAB for TREC Deep Learning Track (DL) 2020
Shengyao Zhuang, Hang Li, Shuai Wang, Guido Zuccon
Proceedings of the 2021 TREC Deep Learning Track, 2020

Datasets

Agvaluate: A New Test Collection for Both Passage and Document Retrieval in the Agriculture Domain
Hang Li, Ahmed Mourad, Bevan Koopman, Guido Zuccon
2022

Thesis

Advanced Query Representation and Feedback Methods for Neural Information Retrieval
Hang Li
PhD Thesis, The University of Queensland (2026). 2026

Pre-Prints and Submitted Manuscripts

Bridging the Gap Between Small and Large Dense Retrievers via Offline Generative Feedback
Hang Li, Chuting Yu, Xiao Wang, Bevan Koopman, Guido Zuccon
Submitted to ACM Transactions on Information Systems (2026). 2026

When LLM Judges Inflate Scores: Exploring Overrating in Relevance Assessment
Chuting Yu, Hang Li, Guido Zuccon, Joel Mackenzie, Teerapong Leelanupab
Submitted to the 49th International ACM SIGIR Conference on Research and Development in Information Retrieval (2026). 2026

Pseudo-Relevance Feedback Can Improve Zero-Shot LLM-Based Dense Retrieval
Hang Li, Xiao Wang, Bevan Koopman, Guido Zuccon
On arXiv cs.IR at https://arxiv.org/abs/2503.14887 (2025). 2025

TPRF: A Transformer-based Pseudo-Relevance Feedback Model for Efficient and Effective Retrieval
Hang Li, Chuting Yu, Ahmed Mourad, Bevan Koopman, Guido Zuccon
On arXiv cs.IR at https://arxiv.org/abs/2401.13509 (2024). 2024

LLM-VPRF: Large Language Model Based Vector Pseudo Relevance Feedback
Hang Li, Shengyao Zhuang, Bevan Koopman, Guido Zuccon
On arXiv cs.IR at https://arxiv.org/abs/2504.01448 (2024). 2024

Work Experience

IELab at The University of Queensland *Queensland, Australia*

Research Assistant / PhD Student *December 2020 - Present*

- Conduct research in Information Retrieval, Machine Learning, and Large Language Models, focusing on Agentic AI, Conversational Search, and Question Answering.
- Developed methods for integrating pseudo-relevance feedback techniques into neural information retrieval pipelines for improving information retrieval performance using PyTorch, HuggingFace, PyTerrier, Pyserini, Transformer.
- Applied agentic AI to agricultural domains, contributing to sustainable technology research aligned with EU Climinvest goals.
- Published research in SIGIR, WSDM, ECIR, TOIS, and other venues; produced open research datasets and reproducible code.
- Assisted in writing and reviewing project reports; contributed to securing competitive research funding.
- Mentored undergraduate and postgraduate students, providing guidance on ML, IR, and LLM-based projects.
- Presented findings at international conferences (SIGIR, ECIR), enhancing institutional research visibility.

IELab at The University of Queensland *Queensland, Australia*

Summer Research Scholar *November 2019 - March 2020*

- Designed and implemented AI-driven search and recommendation prototypes to support systematic review automation.
- Explored early applications of conversational search in the biomedical and scientific domains.
- Contributed to reproducible research by documenting methodologies and preparing datasets for future benchmarking.
- Collaborated with a cross-disciplinary team of researchers, presenting findings in seminars and internal workshops.

Henan She Chuan Technology Co., Ltd. *Zhengzhou, China*

Full Stack Developer *July 2018 - July 2019*

- Built full-stack applications integrating search and recommendation features for Telehealth clients in medical consultation platforms.
- Improved scalability of medical consultation platforms by deploying cloud-native solutions with Docker and Ali-cloud.
- Developed and maintained RESTful APIs to streamline communication between front-end and backend services.
- Enhanced user experience by implementing responsive web interfaces and optimizing page load times.
- Collaborated with cross-functional teams to ensure secure handling of sensitive medical data in compliance with industry standards.

Shenzhen Dianmao Technology Group Co., Ltd. *Shenzhen, China*

Backend Developer *June 2017 - March 2018*

- Implemented scalable backend services and contributed to e-commerce recommendation engines.
- Designed and optimized RESTful APIs to support high-traffic mobile and web applications.
- Improved system reliability by refactoring legacy code and introducing automated testing pipelines.
- Collaborated with front-end developers and product managers to deliver new features on schedule.
- Utilized databases (MySQL, MongoDB, Redis) to manage large-scale product and user data efficiently.

First Capital Fund Management Co., Ltd. *Shenzhen, China*

Full Stack Developer *August 2016 - June 2017*

- Developed FinTech platforms supporting investment risk assessment and ESG-related data integration for sustainable finance applications.
- Built and deployed a quantitative trading platform enabling automated strategy execution and portfolio optimization.
- Implemented secure APIs and backend services to process high-volume financial transactions in real time.
- Collaborated with quantitative analysts to integrate machine learning models for market trend prediction.

The Velocity Tech Solutions Inc. *Minnesota, United States*

Software Developer *February 2016 - July 2016*

- Delivered enterprise IT asset management solutions with a focus on backend development.

Skills

Programming & Frameworks	Python, PyTorch, PyTerrier, Java, C++, Pandas, NumPy, Transformers, etc.
System & Tools	Docker, OpenShift, AWS, Linux, Git, LaTeX, etc.
Research Expertise	Information Retrieval, Machine Learning, Large Language Models, Agentic AI, etc.
Professional Skills	Project Proposal/Report Writing, Research Publications/Presentations, Project Management

Achievements

2022 **SIGIR Student Travel Grant**,
2021 **Huawei DIGIX Global AI Challenge**, Global Champion, US$30,000
2021 **Best Student Paper Award in ADCS Conference**,
2020 **SIGIR Student Travel Grant**,
2020 **UQ Research Training Program Stipend (Highly Competitive)**, Awarded for 4 Years
2019 **UQ Dean's Commendation for Academic Excellence**, High Distinction
2012 **Global Excellence Scholarship**, Awarded for 4 Years

Academic Services

Guest Lecturer	INFS7410 Information Retrieval (2025)
Teaching Assistant:	INFS7410 Information Retrieval (2020-2024), CSSE7610 Concurrency (2025)
Head of Teaching Assistant:	INFS7202 Web Information System (2020-2022)
Conference Proceeding Chair:	CIKM 2021
Conference Program Committee Member:	CIKM, SIGIR, ECIR, SIGIR, WSDM, etc.
Journal Reviewer:	TOIS, etc.