

# To Eun Kim

Information Retrieval | LLM | Retrieval-Enhanced ML | Language Agents | Evaluation

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🎓 [Google Scholar](#)

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## Education

**Carnegie Mellon University (CMU)**

Aug 2023 - (2028)

Ph.D. Language and Information Technology at Language Technologies Institute (LTI).

Advisor: [Prof. Fernando Diaz](#)

Focus: Information Retrieval, Retrieval-Enhanced Machine Learning, Language Agents

**University College London (UCL)**

Sep 2018 - Sep 2022

M.Eng. Computer Science (equivalent to a US Bachelor's & Master's degree) **First-Class Honours**

Minor: Engineering Mathematics

Thesis: [Multi-Task Neural User Simulator for Task Oriented Dialogue System](#)

## Publications

**MoR: Better Handling Diverse Queries with a Mixture of Sparse, Dense, and Human Retrievers**

J.S Kalra\*, X. Zhao\*, [T.E. Kim](#), F. Cai, F. Diaz, T. Wu [\[paper\]](#) [\[code\]](#)

(*EMNLP 2025 Main*) *Conference on Empirical Methods in Natural Language Processing*

**TeamCMU at Touché: Adversarial Co-Evolution for Advertisement Integration and Detection in Conversational Search**

[T.E. Kim](#), J. Coelho, G. Onilude, J. Singh [\[paper\]](#) [\[code\]](#)

(*CLEF 2025 Touché Lab*) *16th Conference and Labs of the Evaluation Forum*

*Best Paper Award*

**LTRR: Learning To Rank Retrievers for LLMs**

[T.E. Kim](#), F. Diaz [\[paper\]](#) [\[code\]](#)

(*SIGIR 2025 LiveRAG Workshop*) *Spotlight*

**Tip of the Tongue Query Elicitation for Simulated Evaluation**

Y. He\*, [T.E. Kim](#)\*, F. Diaz, J. Arguello, B. Mitra [\[paper\]](#) [\[code1\]](#) [\[code2\]](#)

(*SIGIR 2025*) *48th ACM SIGIR Conference on Research and Development in Information Retrieval*

**Overview of the TREC 2024 Tip-of-the-Tongue Track**

J. Arguello, S. Bhargav, F. Diaz, [T.E. Kim](#), Y. He, E. Kanoulas, B. Mitra [\[paper\]](#)

(*TREC 2025*) *The 33<sup>rd</sup> Text Retrieval Conference*

**Towards Fair RAG: On the Impact of Fair Ranking in Retrieval-Augmented Generation**

[T.E. Kim](#), F. Diaz [\[paper\]](#) [\[code\]](#)

(*ICTIR 2025*) *The 15th Int'l Conference on Innovative Concepts and Theories in Information Retrieval*

(*NeurIPS 2024 AFME Workshop*) *Top-3 Spotlight*

**Retrieval-Enhanced Machine Learning: Synthesis and Opportunities**

[T.E. Kim](#), A. Salemi, A. Drozdov, F. Diaz, H. Zamani

([SIGIR 2025 Tutorial](#)) ([SIGIR-AP 2024 Tutorial](#))

[\[Manuscript/Survey\]](#) *Under Review for Journal Publication*

**A Comprehensive Survey on Generative Diffusion Models for Structured Data**

H. Koo, [T.E. Kim](#) [\[paper\]](#)

*arXiv*, 2023

**A Multi-Task Based Neural Model to Simulate Users in Goal-Oriented Dialogue Systems**

[T.E. Kim](#), A. Lipani [\[paper\]](#) [\[poster\]](#) [\[code\]](#)

(*SIGIR 2022*) *45th ACM SIGIR Conference on Research and Development in Information Retrieval*

**Condita: A State Machine Like Architecture for Multi-Modal Task Bots**

J. Ramos\*, [T.E. Kim](#)\*, Z. Shi, X. Fu, F. Ye, Y. Feng, A. Lipani [\[paper\]](#)

*Alexa Prize TaskBot Challenge Proceedings*, 2022

## When and What to Ask Through World States and Text Instructions: IGLU NLP Challenge Solution

Z. Shi\*, J. Ramos\*, [T.E. Kim](#), X. Wang, H. Rahmani, A. Lipani [\[paper\]](#)

(*NeurIPS 2022 Competition*) Interactive Grounded Language Understanding in a Collaborative Environment

Research Prize Winner

## Attention-based Ingredient Phrase Parser

Z. Shi, P. Ni, M. Wang, [T.E. Kim](#), A. Lipani [\[paper\]](#) [\[code\]](#)

(*ESANN 2022*) European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning

Research &  
Industry  
Roles

### CMU Language Technologies Institute (LTI)

Aug 2023 - Present

Graduate Research & Teaching Assistant

Pittsburgh, USA

- Courses taken: 11642 Search Engines (Prof. Jamie Callan); 10701 Intro to ML (Dr. Henry Chai); 11711 Advanced NLP (Prof. Graham Neubig); 11801 Quantitative Evaluation of Language Technologies (Prof. Fernando Diaz); 11797 Question Answering (Prof. Eric Nyberg, Prof. Teruko Mitamura); 11851 Talking to Robots (Prof. Yonatan Bisk)

### UCL Web Intelligence Group

May 2021 - Jun 2023

Research & Teaching Assistant

[UCL Centre for AI](#), London, UK

- Supervised by [Prof. Emine Yilmaz](#) and [Dr. Aldo Lipani](#)
- Leading the Alexa Prize TaskBot Challenge (May 2021 - Mar 2022). Engineered a Task-oriented Dialogue System by using Alexa Skills Kit, Evi, DynamoDB, Lambda, and CodePipeline. Constructed and maintained CI/CD pipelines, deployed multiple micro-services with Flask and Docker, dealing with thousands of user conversations with feedback loop.
- Five TA roles and four research papers.

### Raft AI

Jun 2022 - Jul 2022

Machine Learning Engineer Intern

London, UK

- Tabular information extraction from OCR for freight forwarding automation.
- Use of modern dev tools, e.g., Gitlab, Jira, Sentry, Docker, Kubernetes, GCP.

### UCL (Human-Computer) Interaction Centre - bachelor's group thesis

Oct 2020 - Apr 2021

Project *Olfactory-NLP* with group members and [Prof. Marianna Obrist](#).

- Extracted smell-related phrases and clustered multiple passages into different olfactory groups.
- Literature Review: *An NLP Approach to Classify Smell Experiences*. [\[paper\]](#)
- *Exploring the potential of automating the process of clustering smell stories*. [\[paper\]](#) [\[code\]](#)

### KB Securities

Jun 2020 - Aug 2020

Data Analyst Intern

Seoul, South Korea

- Built a mutual funds recommender system based on Network Analysis, Hierarchical Clustering and Association Rule Mining.
- Built a stock price prediction system using LSTM and news articles. [\[code\]](#)
- Social media sentiment monitoring system using KB's NLP Engine and Automation software.
- Use of Hadoop ecosystem (Map-reduce, Hive, and Hue).

### Royal College of General Practitioners (RCGP)

Oct 2019 - Mar 2020

Software Engineer - UCL Industrial Exchange Network

London, UK

- Implemented a tree-based task-oriented chatbot that assists in checking software compliance regimes of British healthcare organizations based on Dialogflow.

Presentations &  
Invited Talks

Algorithmic Fairness through the Lens of Metrics and Evaluation @ NeurIPS 2024, *Towards Fair RAG: On the Impact of Fair Ranking in Retrieval-Augmented Generation*, 14th Dec., 2024.

NLP Interest Group at The Alan Turing Institute, *Can Dialogue Systems Have Theory-of-Mind Ability?*, 24th Nov., 2022. [\[recording\]](#)[\[slides\]](#)

Knowledge Graphs Interest Group at The Alan Turing Institute (5th meet-up), *Personal Knowledge Graphs: Towards Better Conversational Assistants*, 27th Oct., 2022. [\[recording\]](#) [\[slides\]](#)

Search-Oriented Conversational AI Workshop (SCAI '22), *A Multi-Task Based Neural Model to Simulate Users in Goal-Oriented Dialogue Systems*, 15th Jul., 2022. [\[recording\]](#) [\[slides\]](#)

Awards	2025 CLEF Touché Lab Best Paper Award 2025 SIGIR NSF Student Travel Award – \$2000 2022 NeurIPS Interactive Grounded Language Understanding (IGLU) – Research Prize – \$650 2022 Automated Knowledge Graph Construction (AKBC) Conference – Registration fee waiver 2022 SIGIR Student Travel Grant – Registration fee waiver 2021 UCL Student Union best societies award – <i>Centenary Award (UCL AI Society)</i> 2021 UCL CS Undergraduate Summer Research Internship Fund – £3,200	
Academic Service	Reviewings: <ul style="list-style-type: none"><li>• CIKM 2022 (subreviewer), ICLR 2023, EMNLP 2025 BlackboxNLP Workshop</li></ul> Tutorials: <ul style="list-style-type: none"><li>• SIGIR-AP 2024, SIGIR 2025</li></ul>	
Teaching Experience	UCL Intense Python Programming course, <b>Course Co-Organiser and Lecturer</b>	March 2023
	<ul style="list-style-type: none"><li>• Designed and led a new intensive programming course for MSc students.</li></ul>	
	UCL COMP0189 Applied Artificial Intelligence, <i>Teaching Assistant</i>	Spring 2023
	<ul style="list-style-type: none"><li>• Delivered weekly practical contents and coursework <a href="#">[GitHub]</a></li></ul>	
	UCL COMP0071 Software Engineering, <i>Teaching Assistant</i>	Spring 2023
	UCL CEGE0004 Machine Learning for Data Science, <i>Teaching Assistant</i>	Spring 2023
Community Involvement	UCL CEGE0096 Geospatial Programming, <i>Teaching Assistant</i>	Fall 2022
	<a href="#">UCL Artificial Intelligence Society</a> , <i>Lecturer</i>	2020 - 2022
	NTCIR-19 Tip-of-the-Tongue (ToT) Track, <i>Organizer</i>	
	TREC 2025 Tip-of-the-Tongue (ToT) Track, <i>Organizer</i> ; <a href="#">TREC track website</a>	
	The Alan Turing Institute NLP & KG Interest Group, <i>member</i>	Nov 2022
	The Alan Turing Institute Knowledge Graphs Interest Group, <i>member</i>	Sep 2022
	Automated Knowledge Graph Construction (AKBC) Conference, <i>volunteer</i>	Nov 2022
	<a href="#">UCL Artificial Intelligence Society</a> , <i>Head of Tutorials Team, Lecturer</i>	Sep 2019 - Jun 2022
	<ul style="list-style-type: none"><li>• <b>Founder, maintainer, and lecturer</b> of Machine Learning Tutorial Series</li><li>• Season 20/21: <a href="#">[GitHub]</a> <a href="#">[Lecture Recordings]</a>    Season 21/22: <a href="#">[GitHub]</a></li><li>• Co-organised an international competition, <a href="#">Climate Hack.AI</a> <a href="#">[GitHub]</a> <a href="#">[media coverage]</a></li></ul>	
	<a href="#">NLP paper reading group (Jiphyeonjeon)</a> , <i>Season 2,3 Organizer</i>	May 2021 - Nov 2022
Mentoring	<ul style="list-style-type: none"><li>• Season 2: Survey on Task-Oriented Dialog System and Knowledge Graph construction. <a href="#">[slides]</a> <a href="#">[recording]</a> (spoken in Korean)</li><li>• Season 3: Recent Advances and Challenges in Task-oriented Dialogue Systems. <a href="#">[slides]</a> <a href="#">[recording]</a> (spoken in Korean)</li></ul>	
	Google Developer Student Club, <i>UCL core team - event with <a href="#">Marc Cohen</a></i>	Sep 2021 - Jun 2022
	UCL Korean Society, <i>IT Director - webmail automation</i>	Jun 2020 - May 2021
	CMU Paths to AI, <i>Mentor</i>	Spring 2024, 2025
Software	CMU Graduate Application Support Program	Fall 2023
	UCL CS Transition Mentor, ( <i>helping 1st year CS students</i> )	Sep 2020 - Jun 2022
	<b>Unified API of Apache Kafka &amp; Google Pub/Sub for model serving</b> <ul style="list-style-type: none"><li>• Serving ML models in an event-driven way. <a href="#">[code]</a></li></ul>	Nov 2021
	<b>Propositional Semantic Tableau Validator</b> <ul style="list-style-type: none"><li>• Propositional logic satisfiability checker based on semantic tableau (implemented in C) <a href="#">[code]</a></li></ul>	Dec 2019

Professional Training	Google Developers Korea Machine Learning Bootcamp	Oct 2020 - Jan 2021
	Deep Learning Specialization (Prof. Andrew Ng on Coursera)	Dec 2020
	UCLQ Summer School in Quantum Technology	Sep 2020
	Introduction to AI in the Data Center (NVIDIA)	Mar 2020
	KAIST Artificial Intelligence Bootcamp <a href="#">[Project 1]</a> <a href="#">[Project 2]</a>	Jun 2019 - Aug 2019

Major Skills	<b>Computer Language:</b>	Python, Java, C, Matlab, R, L <sup>A</sup> T <sub>E</sub> X
	<b>Research:</b>	PyTorch, TensorFlow2, HuggingFace, Scikit-Learn
	<b>SW Dev:</b>	Docker, SQL, Kafka, Node, Express, React, Flask
	<b>Platform:</b>	Unix, Git, AWS, Alexa Skills Kit, GCP, Slurm
	<b>Human Language:</b>	English (professional), Korean (native)

References	Available on request.
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last update: Sep 5<sup>th</sup> 2025