

# To Eun Kim

Information Retrieval | NLP | Dialogue Systems | Knowledge Graphs | Search and QA

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| Education                 | <b>University College London (UCL)</b><br>M.Eng. Computer Science (integrated master's degree)<br>Minor: Modern Applications of Engineering Mathematics<br>Thesis: <a href="#">Multi-Task Neural User Simulator for Task Oriented Dialogue System</a>   | Sep 2018 - Aug 2022<br><b>First-Class Honours</b>                |
| Ongoing Work              | Response ranking with conversational look-ahead (Targeting SIGIR '23 - 1st author)<br>User satisfaction estimation with Hawkes Transformer (Targeting ACL '23 - 2nd author)   |  |
| Publications              | <b>T.E. Kim</b> , A. Lipani. <i>A Multi-Task Based Neural Model to Simulate Users in Goal-Oriented Dialogue Systems</i> . [Short Paper]. International ACM SIGIR Conference on Research and Development in Information Retrieval, 2022 (SIGIR '22). <a href="#">[paper]</a> <a href="#">[poster]</a> <a href="#">[code]</a><br><b>T.E. Kim*</b> , J. Ramos*, <b>T.E. Kim*</b> , Z. Shi, X. Fu, F. Ye, Y. Feng, A. Lipani. <i>Conditia: A State Machine Like Architecture for Multi-Modal Task Bots</i> . Alexa Prize TaskBot Challenge Proceedings, 2022. <a href="#">[paper]</a><br>Z. Shi, P. Ni, M. Wang, <b>T.E. Kim</b> , A. Lipani. <i>Attention-based Ingredient Phrase Parser</i> . European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning, 2022 (ESANN '22). <a href="#">[paper]</a> <a href="#">[code]</a>   |  |
| Under Review              | <b>T.E. Kim</b> , S. Mitroi, R. Kumar, N. Ranade, K. Selvaratnam, L. Xu, E. Maggioni, M. Obrist. <i>Exploring the potential of automating the process of clustering smell stories</i> . International Journal of Human-Computer Studies (IJHCS '23).  |  |
| Workshops & Presentations | <i>Recent Advances in Applications of Knowledge Graphs</i> . To be presented at the 5th Meet-up of Knowledge Graphs Interest Group at Alan Turing Institute, 27th Oct., 2022.<br><i>A Multi-Task Based Neural Model to Simulate Users in Goal-Oriented Dialogue Systems</i> . Presented at Search-Oriented Conversational AI Workshop, 2022 (SCAI '22). <a href="#">[recording]</a> <a href="#">[slides]</a>  |  |
| Research Experience       | <b>UCL Web Intelligence Group</b> - Graduate Research Assistant<br>Conducting and assisting research with Prof. Emine Yilmaz and Dr. Aldo Lipani. <ul style="list-style-type: none"><li>Highly contributed (first authored) to the <i>Alexa Prize TaskBot Challenge</i>, taking charge of engineering/DevOps challenges, such as AWS services integration, deployment of ranking/search/QA models, and making effective user feedback loops.</li><li>Published three papers in top academic venues, and extending the research using novel ideas.</li><li>Leading the <i>Viral Content Ranking and Generation</i> project. Aiming to construct a neural learning-to-rank model that ranks marketing articles in terms of future virality in social media.</li><li>Participating in a NeurIPS 2022 challenge - Interactive Grounded Language Understanding in a Collaborative Environment (IGLU) with PhD students.</li><li>Join in regular reading group.</li></ul> <b>Amazon Alexa Prize TaskBot Challenge</b> - Team Conditia<br>Co-led the team to the Quarter-final stage. <ul style="list-style-type: none"><li>Engineering a Task-oriented Dialogue System by using Alexa Skills Kit, Evi, DynamoDB, Lambda, CodePipeline, and SageMaker. Constructed and maintained CI/CD pipelines, deployed multiple micro-services with Flask and Docker, dealing with thousands of user conversations (details are addressed in the Master's thesis).</li><li>Designed and implemented a novel state machine-like architecture for dialogue policy decision.</li><li>Research was focused on Information Retrieval, Knowledge Graph, Question-Answering, Ranking, and Dialogue State Tracking.</li></ul> <b>UCL (Human-Computer) Interaction Centre</b> - bachelor's group thesis<br>Project <i>Olfactory-NLP</i> with group members and Prof. Marianna Obrist. <ul style="list-style-type: none"><li>Extracted smell-related phrases and clustered multiple passages into different olfactory groups.</li></ul> | May 2021 - Present<br>May 2021 - Mar 2022<br>Oct 2020 - Apr 2021 |

- Literature Review: *An NLP Approach to Classify Smell Experiences*. [\[paper\]](#)
- *Exploring the potential of automating the process of clustering smell stories*. [\[paper\]](#) [\[code\]](#)
- Edited version is recently submitted and under review in the International Journal of Human-Computer Studies.

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| Industry Experience   | <p><b>Vector AI</b> Jun 2022 - Jul 2022<br/> Machine Learning Engineer Intern London, UK</p> <ul style="list-style-type: none"> <li>• Cross-functional intern in both Core-ML and Forward-deployed engineering teams.</li> <li>• Tabular information extraction from bill of ladings and business registration documents based on OCR results for freight forwarding automation.</li> <li>• Use of modern dev tools, e.g., Gitlab, Jira, Sentry, Docker, Kubernetes, GCP.</li> </ul> <p><b>KB Securities</b> Jun 2020 - Aug 2020<br/> Data Analyst Intern Seoul, South Korea</p> <ul style="list-style-type: none"> <li>• Rule-based Investment Funds Recommender System based on Network Analysis, Hierarchical Clustering and Association Rule Mining.</li> <li>• Stock Price Prediction System using LSTM Network and Natural Language News Data. <a href="#">[code]</a></li> <li>• Piloted a Social Media Monitoring System using KB's NLP Engine and Automation (RPA) software. Real-time sentiment monitoring in the comment sections.</li> <li>• Heavy use of SQL in the Hadoop ecosystem (Map-reduce, Hive, and Hue).</li> </ul> <p><b>Royal College of General Practitioners (RCGP)</b> Oct 2019 - Mar 2020<br/> Software Engineer - UCL Industrial Exchange Network London, UK</p> <ul style="list-style-type: none"> <li>• Built a tree-based task-oriented chatbot that assists in checking software compliance regimes of British healthcare organizations.</li> <li>• Built a RESTful API for user intents and entities detection using Dialogflow and React, Express Node, and MongoDB.</li> <li>• Python scripts for chatbot integration testing. <a href="#">[code]</a></li> </ul> |
| Teaching Experience   | <p>UCL COMP0189 Applied Artificial Intelligence, <i>Teaching Assistant</i> (Spring 2023)<br/> UCL COMP0071 Software Engineering, <i>Teaching Assistant</i> (Spring 2023)<br/> UCL CEGE0004 Machine Learning for Data Science, <i>Teaching Assistant</i> (Spring 2023)<br/> UCL CEGE0096 Geospatial Programming, <i>Teaching Assistant</i> Fall 2022</p>   |
| Awards                | <p>2022 SIGIR '22 Student Travel Grant – Free registration fee<br/> 2021 UCL Student Union best societies award – <i>Centenary Award (UCL AI Society)</i><br/> 2021 UCL CS Undergraduate Summer Research Internship Fund – £3,200</p>   |
| Community Involvement | <p>Alan Turing Institute Knowledge Graphs Interest Group, <i>member</i> Sep 2022 - Present<br/> CIKM 2022, <i>Sub-reviewer</i> July 2022<br/> UCL Artificial Intelligence Society, <i>Head of Tutorials Team</i> Sep 2019 - Jun 2022</p> <ul style="list-style-type: none"> <li>• Founder, maintainer, and lecturer 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> </ul> <p>NLP paper reading group (Jiphyeonjeon), <i>Season 2,3 Organizer</i> May 2021 - Nov 2022</p> <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> <p>UCL CS Transition Mentor, <i>Mentor - helping 1st year CS students</i> Sep 2020 - Jun 2022<br/> UCL Korean Society, <i>IT Director - webmail automation</i> Jun 2020 - May 2021<br/> UCL Korean Culture Society, <i>Korean Language Tutor - biweekly lessons</i> Sep 2020 - Mar 2021<br/> Stanford CS224n study group <a href="#">[slides]</a> Winter 2020</p>   |

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| Selected Coursework & Projects | <p><b>COMP0087 Statistical Natural Language Processing</b> <span style="float: right;">Spring 2022</span><br/>         Taught by Prof. Sebastian Riedel, received high mark (76.62%).</p> <ul style="list-style-type: none"> <li>• <i>Fake reviews generations via large language models.</i> <a href="#">[paper]</a></li> </ul> <p><b>Unified API of Apache Kafka &amp; Google Pub/Sub</b> <span style="float: right;">Nov 2021</span></p> <ul style="list-style-type: none"> <li>• Simple ML model is served and does inferences in an event-driven way. <a href="#">[code]</a></li> </ul> <p><b>COMP0022 Database and Information Management Systems</b> <span style="float: right;">Spring 2021</span><br/>         Best group coursework nominated - Movie Analytics Web App.</p> <ul style="list-style-type: none"> <li>• Microservice architecture consisting of a NestJS REST API, PostgreSQL DB, and Redis cache. Designed a normalized ERD for DB and optimized queries, seeing more than 10% speed increase. APIs can pre-cache anticipated requests, enabling extremely low latency infinite scrolling. <a href="#">[code]</a></li> </ul> <p><b>BENG0095 Data Mining and Analysis</b> <span style="float: right;">Winter 2020</span><br/>         Best group coursework nominated, received high mark (79.88%).</p> <ul style="list-style-type: none"> <li>• Data visualization, model training and selection, hyperparameter tuning, and evaluation. <a href="#">[paper]</a> <a href="#">[code]</a></li> </ul> <p><b>Building Conversational AI for Messenger Hackathon</b> <span style="float: right;">Dec 2019</span><br/>         Hackathon at Facebook London</p> <ul style="list-style-type: none"> <li>• Built a Facebook's messenger-bot that checks if user's reply to one's lover is okay to send or not by fine-tuning a BERT model for sentiment analysis. <a href="#">[code]</a></li> </ul> <p><b>Propositional Semantic Tableau Validator</b> <span style="float: right;">Dec 2019</span></p> <ul style="list-style-type: none"> <li>• Parse propositional logic, build a semantic tableau, and check its logical satisfiability (implemented in C) <a href="#">[code]</a></li> </ul> |
| Professional Training          | <p>Google Developers Korea Machine Learning Bootcamp <span style="float: right;">Oct 2020 - Jan 2021</span><br/>         Deep Learning Specialization (Prof. Andrew Ng on Coursera) <span style="float: right;">Dec 2020</span><br/>         UCLQ Summer School in Quantum Technology <span style="float: right;">Sep 2020</span><br/>         Introduction to AI in the Data Center (NVIDIA) <span style="float: right;">Mar 2020</span><br/>         KAIST Artificial Intelligence Bootcamp <a href="#">[Project 1]</a> <a href="#">[Project 2]</a> <span style="float: right;">Jun 2019 - Aug 2019</span></p>  |
| Major Skills                   | <p><b>Programming:</b> Python, Java, C, L<sup>A</sup>T<sub>E</sub>X<br/> <b>ML/DL:</b> PyTorch, TensorFlow/Keras, Scikit-Learn, OpenCV<br/> <b>Data skill:</b> SQL, Hadoop, Numpy/Pandas/Matplotlib<br/> <b>SW Dev:</b> Apache Kafka, Node, Express, React, Flask, MongoDB, PostgreSQL<br/> <b>Platforms:</b> Linux, Git, Docker, AWS, GCP</p>  |
| References                     | <p><b>Prof. Emine Yilmaz</b><br/>         Professor and Turing Fellow at UCL, Dept. of Computer Science, <b>Email:</b> emine.yilmaz@ucl.ac.uk</p> <p><b>Dr. Aldo Lipani</b><br/>         Assistant Professor in Machine Learning at UCL, <b>Email:</b> aldo.lipani@ucl.ac.uk</p> <p><b>Prof. Marianna Obrist</b><br/>         Professor of Multisensory Interfaces at UCL, Dept. of Computer Science, <b>Email:</b> m.obrist@ucl.ac.uk</p>  |