

Makbule Gulcin Ozsoy

London, UK

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Interests

Machine learning, Information retrieval, Natural language processing, Recommender systems

Work Experience

Neo4j

London, UK

Software Engineer/Machine Learning Engineer

April 2024-Present

- **Natural Language Processing (Python)**

- Contributed to evaluating and developing modules for Retrieval Augmented Generation (RAG) applications, focusing on graph databases and integrating large language models (LLMs).
- Led and contributed to the design and implementation of the Text2Cypher project, converting natural language into Cypher graph database queries.
- Released the first version of the Text2Cypher dataset and fine-tuned model, improving performance by 7-10% on offline metrics, and shared the results through blog posts and an academic publication.

Short-Term Roles

London, UK

Software Engineer/Machine Learning Engineer

September 2023 - April 2024

- **Natural Language Processing (Python), Software Development (Go)**

- Designed solutions for extracting knowledge from finance-related chat data leveraging large-language models (LLM) and fine-tuning techniques. Proposed and implemented solutions to improve performance, resulting in a 1.5% increase.
- Designed modules for authentication and access control for a trading engine intended for the digital asset market.

Meta (formerly Facebook)

London, UK

Software Engineer/Machine Learning Engineer

January 2021 - August 2023

- **Recommender Systems, Ranking (Python)**

- Designed solutions for ranking and product recommendation in an e-commerce platform utilizing multiple machine learning techniques.
- Designed modules for data preparation, feature extraction, model training/optimization and offline evaluation.
- Proposed and implemented solutions to improve performance, resulting in a 5.5% increase (2022) and a 2.1% increase (first half of 2023).

• Served as a mentor, providing guidance to new hires within the company and the team, and successfully assisting seven mentees.

Insight Centre for Data Analytics, University College Dublin (UCD)

Dublin, Ireland

Postdoctoral Researcher

February 2019 - January 2021

- **Recommender Systems (Python)**

- Designed and developed modules for recommenders systems.
- Conducted research on Reinforcement Learning-based and Heterogeneous Information Networks-based recommendation systems, and published related work.

• Co-supervised and mentored students in the research group. Reviewed research papers for various journals.

Unscrambl LLC

Ankara, Turkey

Data Scientist

October 2016 - February 2019

- **Natural Language Processing, Machine Learning (Python)**

- Implemented the early version of a chatbot designed for financial institutions and banks. Developed modules for Named Entity Recognition and intent classification for Turkish and English texts
- Conducted batch data analysis and constructed predictive models to gain insights and address business issues, specifically in the telecom and finance industries.

Early Roles

Ankara, Turkey

Software Engineer, Researcher

June 2008 - October 2016

- **Natural Language Processing (Java), Computer Networks (C++), Image processing (C++)**

- Implemented NLP modules for a sentiment analysis tool tailored to short unstructured Turkish documents. Implemented graphical user interface modules for a desktop application using Java Swing. Implemented modules for inter-domain routing algorithms on Mobile Ad-Hoc Networks.
- Worked in High Frequency radio communications domain. Developed a layered network protocol and clients for Stanag 5066. Developed modules related to routing algorithms in ad-hoc networks.
- Implemented modules for real-time moving object tracking and object classification in images. Developed modules for remote sensing and processing of satellite images.

Education

Middle East Technical University (METU)

PhD, Computer Engineering, Recommender Systems

Ankara, Turkey

September 2011 - June 2016

- Dissertation Title: A Multi-Objective Recommendation System
- Visiting Student, Computer Science, University of Calgary, Calgary-Alberta, Canada (October 2014 - September 2015)

Ankara, Turkey

MSc, Computer Engineering, Natural Language Processing

September 2008 - February 2011

- Dissertation Title: Text Summarization Using Latent Semantic Analysis

Ankara, Turkey

Middle East Technical University (METU)

BSc, Computer Engineering

September 2003 - June 2008

- Senior Year Project: RadioRead - Text mining on Turkish medical radiology reports

Selected Publications

All

See <https://mgulcin.github.io/research/> or
https://scholar.google.com/citations?user=Cmbcf_UAAAAJ for the full list.

2025

Makbule Gulcin Ozsoy, Leila Messallem, Jon Besga, Gianandrea Minneci, Text2Cypher: Bridging Natural Language and Graph Databases, GENAIK workshop, COLING, (2025)

2024

Makbule Gulcin Ozsoy, Multilingual Prompts in LLM-Based Recommenders: Performance Across Languages, ROEGEN workshop, RecSys, (2024)

2024

Makbule Gulcin Ozsoy, Multi-Margin Cosine Loss: Proposal and Application in Recommender Systems, International Conference on Machine Learning and Applications (ICMLA), (2024)

2021

Bichen Shi, Elias Z. Tragos, Makbule Gulcin Ozsoy, Ruihai Dong, Neil Hurley, Barry Smyth, Aonghus Lawlor. Dares: An asynchronous distributed recommender system using deep reinforcement learning. IEEE Access 9 (2021)

2020

Makbule Gulcin Ozsoy, Diarmuid O'Reilly Morgan, Panagiotis Symeonidis, Elias Z Tragos, Neil Hurley, Barry Smyth, Aonghus Lawlor. MP4Rec: Explainable And Accurate Top-N Recommendations In Heterogeneous Information Networks. IEEE Access 8 (2020)

2019

Bichen Shi, Makbule Gulcin Ozsoy, Neil Hurley, Barry Smyth, Elias Z. Tragos, James Geraci, Aonghus Lawlor. PyRecGym: A Reinforcement Learning Gym for Recommender Systems. RecSys 2019: 491–495 (2019)

2018

Makbule Gulcin Ozsoy, Tansel Ozyer, Faruk Polat, Reda Alhaj. Realizing Drug Repositioning by Adapting a Recommendation System to Handle the Process. BMC Bioinformatics 19(1): 136 (2018)

2016

Makbule Gulcin Ozsoy. From Word Embeddings to Item Recommendation. arXiv preprint arXiv: 1601.01356 (2016)

2014

Makbule Gulcin Ozsoy, Kezban Dilek Onal, Ismail Sengor Altingovde. Result Diversification for Tweet Search. WISE 2014: 78-89 (2014)

2011

Makbule Gulcin Ozsoy, Ferda Nur Alpaslan, Ilyas Cicekli. Text Summarization using Latent Semantic Analysis. Journal of Information Science 37(4): 405-417 (2011)

Skills

Programming Languages

Python, SQL (Presto, MySQL), Java, C++

Data Analysis and Machine Learning Tools

HuggingFace, Unslot, Axolotl, Pandas, Numpy, Scikit-learn, Jupyter Notebook, gensim, ChainerRL, Tensorflow, Wandb, spaCy, Rasa NLU, R, Apache Lucene, Weka, Mallet, LingPipe

Other Scientific Tools

OMNET++, Matlab, Apache Spark, OSGI

Software Engineering Tools

VSCode, IntelliJ IDEA, RunPod, Git, , Atlassian Platforms (JIRA, Confluence), IBM Rational Platforms (ClearCase, ClearQuest, RequisitePro, Rational Software

Languages

English

Professional proficiency

Turkish

Native