

# 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 & LLM Systems (Python)**

- Led the Text2Cypher project, converting natural language into Cypher queries; released first dataset and fine-tuned model, improving offline performance by 7–10%.
- Built evaluation frameworks with composite metrics; benchmarked open-weight and API-access LLMs (Gemma, Llama, Gemini, GPT).
- Improved fine-tuning, inference, and evaluation pipelines for LLMs; designed prompt strategies and automated optimization workflows.
- Proposed and implemented Cypher refinement loops; shared insights via blog posts, inspiring adoption by other teams.
- Collaborated with external partners and increased research visibility via workshop presentations (COLING'25, ESWC'25, SIGMOD'25)

### 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 using LLMs and fine-tuning techniques; improved performance by 1.5%.
- Developed modules for authentication and access control for a digital asset trading engine.
- Created data pipelines and preprocessing workflows to support scalable model training and evaluation.
- Maintained documentation and shared technical updates with stakeholders, ensuring reproducibility and clarity.

### 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 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

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

Ankara, Turkey

September 2011 - June 2016

## Middle East Technical University (METU)

MSc, Computer Engineering, Natural Language Processing

- Dissertation Title: Text Summarization Using Latent Semantic Analysis

Ankara, Turkey

September 2008 - February 2011

## Middle East Technical University (METU)

BSc, Computer Engineering

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

Ankara, Turkey

September 2003 - June 2008

# Selected Publications

All	See <a href="https://scholar.google.com/citations?user=Cmbcf_UAAAAJ">https://scholar.google.com/citations?user=Cmbcf_UAAAAJ</a> for the full list.
2025	Makbule Gulcin Ozsoy, Enhancing Text2Cypher with Schema Filtering, TEXT2KG workshop, ESWC, (2025)
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)
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 Altinogvde. 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

Machine Learning & NLP	LLM fine-tuning and optimization, prompt engineering, text-to-query systems, recommender systems, evaluation frameworks, NLP pipelines (spaCy, Rasa, gensim)
Programming & Data Tools	Python, Pandas, NumPy, Scikit-learn, TensorFlow, HuggingFace, Unsloth, Jupyter Notebook
Systems & Engineering	ML pipelines, validation/refinement loops, reproducible experimentation, scalable data workflows, software architecture, CI/CD (Git, Atlassian).
Leadership & Research Impact	Cross-team project ownership, mentorship, technical strategy, publications, conference presentations, external partners, process and roadmap improvement.

# Languages

English	Professional proficiency
Turkish	Native