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 the first dataset and fine-tuned the 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)   *Ankara, Turkey*
PhD, Computer Engineering, Recommender Systems   *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)

Middle East Technical University (METU)   *Ankara, Turkey*
MSc, Computer Engineering, Natural Language Processing   *September 2008 - February 2011*
- Dissertation Title: Text Summarization Using Latent Semantic Analysis

Middle East Technical University (METU)   *Ankara, Turkey*
BSc, Computer Engineering   *September 2003 - June 2008*
- Senior Year Project: RadioRead - Text mining on Turkish medical radiology reports

Selected Publications

All   See `https://scholar.google.com/citations?user=Cmbcf_UAAAAJ` 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 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

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