

# Muhammed Yusuf Kocyigit

PHD, COMPUTER SCIENCE, BOSTON UNIVERSITY  
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## Education

### Boston University

Boston, MA/USA

PHD IN COMPUTER SCIENCE / ADVISOR: PROF. DERRY WIJAYA

2020 - 2025

- Research in LLM evaluation and the relationship between data and model generalization
- Coursework include: Towards Universal NLP, Graduate Networks, Programming Languages, Random Computing

### Bogazici University

Istanbul, TR

MS & BS IN ELECTRICAL AND ELECTRONICS ENGINEERING

2012 - 2017 - 2020

- Research in Machine translation evaluation, Senior project: Handwritten text generation using conditional GANs
- Related Coursework: Graduate Deep Learning(AA), Advanced Speech Processing(AA), Machine Learning(BA), Pattern Recognition(AA), Bioinformatics(AA), Graduate Artificial Neural Networks(AA), Management for Engineers(AA)

## Professional Experience

### Google

Mountain View, CA, USA

RESEARCH SCIENTIST | MEMBER OF GEMINI LARGE SCALE PRETRAINING CORE

2025 - Present

- Analyze large-scale training runs for metric anomalies potentially caused by contamination.
- Research improved decontamination recipes to identify contamination early.
- Research methods to improve evaluation signal-to-noise ratio (SNR) using test-train overlap metrics.
- Investigate how different training stages affect model performance, memorization, and generalization.
- Improve the training of task-specific, efficient small language models using synthetic data.

### Boston University Artificial Intelligence Research Group

Boston, MA, USA

PHD, RESEARCH FELLOW

2020 - 2025

- Primary research focus: natural language evaluation, with a particular emphasis on data contamination and its effects on model performance.
- Investigated the effects of data contamination on overestimation in model performance, with two large scale studies.
- Enhanced sentence embeddings for downstream transfer tasks using diverse augmentations and contrastive learning methods.
- Enhanced compositional generalization evaluation in semantic parsing models by analyzing train-test split complexities through refining TMCD splits.
- Developed cross-lingual representations through multitask and contrastive learning for quality estimation and parallel corpus mining.
- Conducted a study on temporal bias detection in books and news datasets, funded by the **2021 Google Research Scholar Program**.
- Led a research initiative on Ottoman handwritten text recognition, securing **\$50K** funding from the Scientific Research Council of Turkey.

### Google

Mountain View, CA, USA

RESEARCH SCIENTIST INTERN / HOST: DANIEL DEUTSCH

May 2024 - Jan 2025

- Quantified the effects of data contamination on large language model (LLM) performance, highlighting implications for evaluation reliability.
- Designed scalable and robust experimental frameworks to measure contamination impact and developed methodologies to improve evaluation data selection.
- Prepared research findings for submission to a peer-reviewed conference.

### FAIR, Meta

London, UK

RESEARCH SCIENTIST INTERN / HOST: DIEUWKE HUPKES

October 2023 - April 2024

- Developed methods to define and detect data contamination between evaluation sets and pretraining data of large language models (LLMs).
- Analyzed performance overestimation caused by contamination and provided insights to improve understanding of model metrics within the current evaluation paradigm.
- Authored a research paper (currently under review) detailing proposed contamination detection methods; the methodology and code were applied to contamination analysis for LLaMA 3.1.

### Amazon

Cambridge, UK

APPLIED SCIENCE INTERN / HOST: EMILIO MONTI

June 2022 - September 2022

- Collaborated with the Semantic Understanding team on evaluating and enhancing compositional generalization in semantic parsing models.
- Developed an extension to TMCD splits to ensure more robust convergence for compositionally challenging scenarios.
- Explored techniques to improve compositional generalization using meta-learning and chain-of-thought prompting strategies.
- Quantified characteristics of train-test splits that contribute to compositional complexity and challenges.

## TRIA AI

Istanbul, TR

### Co-FOUNDER & CEO

2018 - 2020

- Founded company, led business development, closed contracts worth over **\$100K**, and managed client relations. Worked with the C-Suite of LC Waikiki, multi-billion retailer present in 40 countries, to guide their AI strategy to increase online sales.
- Deployed an ML model for LC Waikiki for behavioral customer segmentation, customer lifetime value prediction and churn analysis that achieved **+100%** increase in conversion rates for targeted ads.
- Worked with DEDAS, one of Turkey's biggest electric distributors, to detect illegal uses of electricity and increased the detection rate by **+150%** with estimated business impact of **\$500K**.

## Publications

- [1] M. Y. Kocyigit, E. Briakou, D. Deutsch, J. Luo, C. Cherry, and M. Freitag, "Overestimation in llm evaluation: A controlled large-scale study on data contamination's impact on machine translation," in *ICML*, 2025.
- [2] M. Y. Kocyigit et al., *Evaluation data contamination in llms: How do we measure it and (when) does it matter?* 2024. arXiv: **2411.03923 [cs.CL]**.
- [3] M. Y. Kocyigit, J. Lee, and D. Wijaya, "Better quality estimation for low resource corpus mining," in *Findings of ACL*, 2022.
- [4] Z. Tang, M. Y. Kocyigit, and D. Wijaya, "Augcse: Contrastive sentence embedding with diverse augmentations," in *AACL-IJCNLP*, 2022.
- [5] M. Y. Kocyigit, H. Kané, A. Abdalla, P. Ajanoh, and M. Coulibali, "Nubia: Neural based interchangeability assessor for text generation," in *INLG, EvalNLEval*, 2020.
- [6] M. Y. Kocyigit and E. E. Kucuk, "Western, religious or spiritual: An evaluation of moral justification in large language models," in *NeurIPS 2023, MP2 Workshop*, 2023.
- [7] M. Y. Kocyigit, H. Kané, P. Ajanoh, A. Abdalla, and M. Coulibali, "Towards neural similarity evaluator," in *NeurIPS 2019, Document Intelligence*, 2019.
- [8] A. Feyza Akyürek, S. Paik, M. Yusuf Kocyigit, S. Akbiyik, Ş. Leman Runyun, and D. Wijaya, "On Measuring Social Biases in Prompt-Based Multi-Task Learning," *Findings of NAACL*, 2022.
- [9] A. Feyza Akyürek, M. Yusuf Kocyigit, S. Paik, and D. Wijaya, "Challenges in Measuring Bias via Open-Ended Language Generation," *NAACL, GeBNLP Workshop*, 2022.
- [10] M. Y. Kocyigit, A. Andy, and D. Wijaya, *A novel method for analysing racial bias: Collection of person level references*, 2023. arXiv: **2310.15847 [cs.CY]**.

## Leadership

### COVID-19 Datathon - Turkey

Istanbul, TR

#### DIRECTOR - TRIA AI

2019

- Organized the first COVID-19 Datathon in Turkey to, digitally, bring people together and fund projects that can serve the public good amidst the crisis. With +60 teams and around 150 participants the top 4 projects were selected and awarded ₺15K.

### Critical Thinking Society, Bogazici University

Istanbul, TR

#### FOUNDER & DIRECTOR

2014 - 2015

- Found the first Critical Thinking Society in Bogazici University where we organized workshops for over 500 participants to teach and engage on how to use critical thinking for argumentation, media consumption and preventing misinformation.

## Awards

2012 **Presidential High Honour Scholarship**, Turkish University Entrance Exam - Sciences Top 100 / 2M students

Istanbul, TR

## Skills

|                    |                                                                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Programming</b> | Python, C, MATLAB, ATS, Assembly, PyTorch, PyTorch-Lightning, Hydra, WandB, TensorFlow, NumPy, pandas, scikit-learn, Transformers, SQL, Docker, Git, Bash |
| <b>Language</b>    | English(Advanced), Arabic(Intermediate), German(Intermediate), Turkish(Native)                                                                            |