Ömer Veysel Çağatan

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Education

Koc University, Sarıyer, Istanbul — Sep 2020-Jun 2024
Bachelor of Science
Major: Computer Engineering
Tracks: Artificial Intelligence, Data Analytics

Research Experience

Preference Learning/RLHF — Nov 2024-Present
Developing a method to facilitate online reinforcement learning with human feedback (RLHF) without relying on a reference model.

Data-Efficient Deep RL supervised by Asst. Prof. Baris Akgun — June 2023-Present
Working on Data-Efficient Reinforcement Learning. My primary aim is to utilize representation learning methods to make more efficient agents.

- Led the BarlowRL project which has been accepted into the ACML 2023. After the success of the BarlowRL, we further explored the impact of different non-contrastive objectives in the SPR which is the baseline of state-of-the-art value-based agents. This work has been accepted to NeurIPS 2024 Workshop: Self-Supervised Learning - Theory and Practice, and is under review at AISTATS 2025.

MMTEB — Apr 2024-Present
Frequent Contributor in The Massive Multilingual Text Embedding Benchmark (MMTEB) is a community-led extension of MTEB to cover embedding tasks for a massive number of languages.

- Added multiple datasets for languages like Turkish, Kurdish, and Armenian, reviewed pull requests, and resolved issues. Coauthor of the publication of MMTEB which is under review in ICLR 2025.

Adversarial Robustness of the Self-Supervised Models supervised by M. Emre Gürsoy — Jan 2024-Present
Investigating the robustness of the Self-supervised visual representation learning models

- We evaluate the adversarial attack performance of 8 top self-supervised models on more than 30 attacks that cover object recognition, object detection, and semantic segmentation. The preprint will be released soon.

Novel Vision Self-Supervised Learning Objective — Nov 2023-Oct 2024
Adapting sigmoid contrastive loss to do self-supervised pretraining.

- Adjusted sigmoid loss to be used as a pretraining objective. Trained and achieved competitive results with SOTA models on CIFAR 10, CIFAR 100, and Tiny Imagenet. Accepted to NeurIPS 2024 Workshop: Self-Supervised Learning - Theory and Practice.

Sample-Efficient Language Model in BabyLM Challenge — Apr 2023-Aug 2023
Worked on building data-efficient language models in a small developmentally plausible corpus.

- Scaled a previous small named BabyBERTa to achieve RoBERTa level grammar understanding. Published in CoNLL–CMCL 2023 Shared Task: The BabyLM Challenge

Non-Contrastive Sentence Embeddings with Prof. Deniz Yuret and Prof. Alper Erdogan Nov 2022-Mar 2023
Worked on developing state-of-the-art sentence embedding models which are created after fine-tuning with non-contrastive objectives.

- Led this project which aimed to enhance BERT embeddings by fine-tuning it with non-contrastive objectives such as CorInfoMax and VICReg. This project has been accepted to EACL 2024.

NLP Intern at FineSci Technology with Assoc. prof. Alptekin Kupcu July 2022-Oct 2022
Worked on developing state-of-the-art Sentiment Analysis models in Turkish.

- Collected and curated a large dataset to obtain the best performant model. Lastly, wrote a comprehensive literature review about Sentiment Analysis in Turkish and the results of the findings from different languages employed in Turkish.

Teaching Experience

Guest Lecture on Basics of Preference Learning for the COMP 442, NLP May 2024.
Teaching Assistant for the ENGR200, Probability and Random Variables Oct 2022-Jan 2023
Tutor for the MATH204, Differential Equations Feb 2022- June 2022.

Other Experience

KoçAssistant Mar 2024-June 2024

- Developed a RAG-based chatbot that answers almost every question about Koç University. The database is created by scraping all university-affiliated websites and retrieving relevant documents with a hybrid search system with probabilistic and fine-tuned semantic models. The overall system is presented with the Cohere Toolkit for users to interact with.

SPARK Autonomous Car Feb 2022-June 2022
Worked as a Computer Vision Engineer in the Software Team.

- SPARK is a autonomous vehicle Team that builds a car from scratch for the national competition. My primary work was the training of the Lane Detection System.

Awards

Vehbi Koç Scholar
Anatolian Scholarship Program

Skills

Programming: Python, C, C++, Java, LaTeX
Deep Learning: Pytorch, Flax/Jax.

Academic Service Reviewer for ICLR 2025, ACML 2023

Publications

Peer Reviewed Conferences

O. V. Cagatan and B. Akgun. *Uncovering RL Integration in SSL Loss: Objective-Specific Implications for Data-Efficient RL* Submitted to the Artificial Intelligence and Statistics, 2025 (AISTATS '25).

MMTEB Team, **O. V. Cagatan**. *MMTEB: Massive Multilingual Text Embedding Benchmark* Submitted to the Thirteenth International Conference on Learning Representations, 2025 (ICLR '25).

O. V. Cagatan. UNSEE: Unsupervised Non-contrastive Sentence Embeddings . To appear in the 18th Conference of the European Chapter of the Association for Computational Linguistics, (EACL

'24).

O. V. Cagatan and B. Akgun. *BarlowRL: Barlow Twins for Data-Efficient Reinforcement Learning.* To appear in the Asian Conference on Machine Learning, 2023 (ACML '23).

Workshops and Shared Tasks

O. V. Cagatan and B. Akgun. *Uncovering RL Integration in SSL Loss: Objective-Specific Implications for Data-Efficient RL* To appear in the NeurIPS 2024 Workshop: Self-Supervised Learning - Theory and Practice, 2024 (NeurIPS SSL Workshop '24).

O. V. Cagatan *SigCLR: Sigmoid Contrastive Learning of Visual Representations* To appear in the NeurIPS 2024 Workshop: Self-Supervised Learning - Theory and Practice, 2024 (NeurIPS SSL Workshop '24).

O. V. Cagatan. *ToddlerBERTa: Exploiting BabyBERTa for Grammar Learning and Language Understanding.* To appear in the CoNLL–CMCL 2023 Shared Task: The BabyLM Challenge (CONLL'23).