Berker Demirel

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Education

- **Sabanci University** — Istanbul, Turkey
  Masters in Computer Science; GPA: 3.9 — *Sep 2021 - Current*
  Courses: Deep Learning, Detection and Estimation Theory, Statistical Methods and Inference, Logic in Computer Science, Mathematical Analysis, Theory of Computation and Pattern Recognition.
- **Sabanci University** — Istanbul, Turkey
  BS. Computer Science and Engineering, BA. Economics (DM) and Mathematics (Minor); GPA: 3.84 — *Sep 2015 - Jun 2021*

Skills Summary

- **Languages:** C, C++, Python, Go, Unix scripting
- **Tools:** PyTorch, MATLAB, OpenMP, GIT, CUDA, CPLEX

Publications

- Berker Demirel, Huseyin Ozkan, **DECOMPL: Decompositional Learning with Attention Pooling for Group Activity Recognition from a Single Volleyball Image**, arXiv preprint arXiv:2303.06439, 2023.
- Arda Asik, Bugra Demir, Berker Demirel and Baris Batuhan Topal, **Vertex Ordering Algorithms for Graph Coloring Problem**, IEEE Signal Processing and Communications Applications, 2020.

Academic Projects

- **UMAP Dimensionality Reduction from Scratch:** Implemented Uniform Manifold Approximation and Projection (UMAP) algorithm in Python from scratch and performed experiments on MNIST and Load Digits datasets. (Dec '22)
- **A Toolbox for ANOVA and Linear Regression:** Calculated confidence intervals and F-tests for 1-way ANOVA, 2-way ANOVA and Linear Regression utilizing Scheffe's and Tukey's methods given test contrasts. (Mar '21)
- **Classifying Mixture of Gaussians using Expectation-Maximization Algorithm:** Utilized EM algorithm to classify 2-dimensional multi-class mixture of gaussian datasets using MATLAB and compared EM algorithm's false alarm rate with oracle decision rule. (Nov '20)
- **Data Generating using Deep Convolutional Generative Adversarial Networks:** Measured performances of 3 different DCGAN algorithms using PyTorch. Learned the distribution of CIFAR10 (10 different animal classes), MNIST (10 different digits) and CelebA (human faces) datasets to generate images. (May '20)
- **Graph Coloring using Reinforcement Learning:** Discovered chromatic numbers of graphs in the dataset of over 250 samples using CPLEX.Created a Q-Learning Algorithm prioritizes nodes with respect to values. (Sep '19)
- **Piecewise Linear Classification with Active Learning:** Evaluated the performance of online perceptron algorithm with split parameters 4, 8, 16, 32 and 64 for binary classification. (Jan '18)

Experience

- **Sabanci University** — Istanbul, Turkey
  Teaching Asistant — *Sep 2021 - Current*
  - **Courses:** Machine Learning, Introduction to Computing, Advanced Computing, and Data Structures
  - Held weekly recitation sessions and office hours.
  - Produced supplementary lecture videos, prepared and graded programming homeworks.
  - As a coordinating TA, handled all the announcements to the class of 200+ students and worked closely with other assistants to help them prepare and grade homeworks.
- **ICHEC (Irish Centre for High End Computing)** — Dublin, Ireland
  Research Intern - Prof. Buket Benek Gursoy — *Jun 2020 - Aug 2020*
  - Participated in the project "GPU Acceleration of Breadth-First Search algorithm in applications of Social Networks" for two months.
  - Proposed 7 different Direction Optimized BFS algorithms for CUDA and ran experiments.
- **Erasmus University Rotterdam** — Rotterdam, Netherlands
  Research Intern - Prof. Ilker Birbil — *Jun 2019 - Aug 2019*
  - Implemented Policy-Gradient based and Value based Reinforcement Learning Algorithms to solve Graph Coloring Problem
  - Prepared a technical report about proposed algorithms and presented the study to the supervisor

Honors and Awards

- Ranked 1st among batch of 20 students in the Department of Economics at Sabanci University.
- Ranked 5th among batch of 90 students in the Department of Computer Science & Engineering at Sabanci University.
- Dean's High Honor List, 2015-2021.
- Honor scholarship for 5 years, awarded for ranking 1878th out of approximately 2 million people in a nationwide university admission exam.