Selim Kuzucu

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Education

- **Middle East Technical University** — Ankara, Turkey
  Bachelor of Science - Computer Engineering; GPA: 3.69/4.00 — *Aug 2019 - June 2023*
  Courses: *Deep Learning, Guided Research, Software Engineering, Operating Systems, Algorithms, Computer Organization, Data Management and File Structures, Data Structures, Formal Languages and Automata Theory, Programming Languages, Statistics, C Programming*
  Activities: *Co-Founder of Management Consulting Club, Member of ACM Student Chapter, Former Swarm Team Member at Robotics Club*

Experience

- **AFAR Lab at University of Cambridge** — February 2022 - Present
  Undergraduate Student Researcher
  - **Research Topic - Investigating and Mitigating Racial Bias Across Facial Image Datasets Through Utilizing Aleatoric Uncertainty**: Working under the supervision of Prof. Sinan Kalkan and Prof. Hatice Güneş and PhD Student Jiaee Cheong.
  - **Contributions:**: Currently obtaining preliminary results through using Deep Deterministic Uncertainty (DDU, Mukhoti et al., 2021) on RAF-DB dataset.
  - **Research Topic - Deep Learning Graph Representations with Task-specific Topology and Multi-dimensional Edge Feature**: Working under the supervision of Prof. Hatice Güneş and Dr. Siyang Song.
  - **Contributions:**: Devised a task called link prediction that considers the co-occurrence patterns of facial activation units that are used for emotion recognition. Utilized G-GCN and GAT to achieve top notch predictions in BP4D and DISFA non-graph datasets. Used **PyTorch** and various visualization methods such as Grad-CAM.

- **METU Image Lab** — October 2021 - Present
  Undergraduate Student Researcher (Part-Time)
  - **Research Topic - Quantifying and Mitigating Imbalance Through Uncertainty Quantification**: Working under the supervision of Assoc. Prof. Sinan Kalkan and Asst. Prof. Emre Akbaş.
  - **Contributions**: Been working on measuring the epistemic uncertainty through utilizing various uncertainty quantification methods such as Deep Ensembles by Lakshminarayanan B. et al. (2017) and DUQ by van Amersfoot et al. (2021). Also running further experiments by utilizing uncertainty estimations to overcome the performance problems caused my imbalance in long-tailed image datasets. Used **PyTorch**. .

- **General Electric** — June 2021 - December 2021
  Software Engineer Intern (Full-time)
  - **Onboarding Documentation with a Bash Script**: Designed and created an onboarding documentation with a multi-purpose bash script for the team that reduced the average technical onboarding time for new members from 10+ days to about 2 days.
  - **User Stories and Other Work**: Earned about 10 story points on average of 58 average total points of the entire team of 11 people during the sprints. Enhanced 15+ different features, from minor UI changes to entire component changes and resolved 10+ bugs.
  - **Angular Version Updates**: Updated the Angular version of all 4 micro-apps from 8.0 to 12.0.

- **Kovan Research Lab** — July 2021 - October 2021
  Undergraduate Student Researcher (Part-Time)
  - **Research Topic - Implementing and Designing Algorithms for UAV Swarms**: Working under the supervision of Assoc. Prof. Erol Şahin, jointly with METURONE Swarm Team.
  - **Contributions**: Implemented the formation algorithms for creating the appropriate formations (star, V, poligon formations etc.) and their conversion from one to other, through **ROS**, **Gazebo**, **Python** and **C++**. Also enhanced the abilities of swarm through adding rotation, displacement and trajectory following functionality.

Publications

- Z. S. Baltacı, K. Öksüz, **S. Kuzucu**, A. Özkan, E. Akbaş, S. Kalkan, "A New Measure for Quantifying and Mitigating Class Imbalance", in preparation, 2022.:
- S. Song, Y. Song, C. Luo, Z. Song, **S. Kuzucu**, Z. Guo, X. Jia, W. Xie, L. Shen,and H. Güneş, "Deep Learning Graph Representation with Task-specific Topology and Multi-dimensional Edge Features" (submitted to T-PAMI), 2022.:

Projects

- **Code Implementation for Uncertainty Quantification in CNN Through the Bootstrap of Convex Neural Networks (AAAI'21)** : Implementation of the models and approaches presented in the paper. The official code was not released, so I implemented it with a friend of mine for anyone who is willing to reproduce the results and verify the validity of approaches. Used **Torch Python**. Available at GitHub (June, 2022)
- **Gomoku San - Gomoku Player**: Used the ultimate solution proposed by Allis et al. to implement an artifically intelligent gaming bot that would beat anyone daring to play the game. Developed with **Python** and **C++** (July, 2021)
- **Log File Examiner**: A log file examiner that examines errors (by using regular expressions) and users from log files (syslog etc.) and stores them in a reverse sorted order with respect to their frequency to 2 separate csv files, developed with **Python** and **Bash**. (March, 2020)

Honors, Awards & Test Scores

- First place in Guided Research Symposium at METU Computer Engineering Department out of 30 different undergraduate research projects with my work in developing a novel one-pass uncertainty quantification method - June 2022
- Scored 118/120 in TOEFL (R: 30, L: 29, S: 30, W: 29) - August 2021
- Earned METU Development Foundation's Academic Merit Scholarship - September 2019
- Ranked in top 0.01 % (270^{th}) at Turkish university entrance exam amongst 2.5 million test takers - July 2019
- Won FIRST Robotics Competition Shanghai Regionals Rookie Allstar Award out of about 50 other rookie teams as the founder team captain of Turkish province of Aydin's first competitive robotics team - March, 2018
- Earned Volunteer Service Award by US Department of State for volunteering for more than 250 hours - June, 2017
- Earned YES Scholarship by the US Department of State to spend an academic year at US - 2016-2017

Teaching and Volunteer Experience

- **METU Computer Engineering Department**: Volunteered as an undergrad teaching assistant in CENG240-Python Programming for Engineers course during Spring'21 semester. Held live QnA and recitation sessions and provided offline support.
- **METU Robotics Club**: Volunteered to teach fellow club members robotics basics, ROS and deep learning for computer vision. Held online tutoring sessions and provided offline support.
- **American Field Service**: Been volunteering since 2017, taking part in various events such as being an interviewer at the selection steps of the new generation of exchange students and fundraising nights.
- **FIRST**: Taught robotics basics at Centralia Middle School in Centralia, WA in 2017 and also robotics basics and Robot-C programming language at 6 different middle schools in Aydin, Turkey in 2018.

Skills Summary

- **Fluent Languages**: Python, C++, JavaScript, C#, C, Bash, MySQL
- **Frameworks and Platforms**: PyTorch, Angular, Flask, Linux, ROS, LaTeX, Intellij, Google Colab
- **Miscellaneous**: Playing the bass, learning about Chinese language and culture (Mo Yan, Yu Hua and Cixin Liu are some of my favorite), reading-researching on gothic and far-eastern literatures