Alper Canberk

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Education

Columbia University **August 2021 - May 2025**

Bachelor of Science in Computer Science, ***GPA:3.93*** *New York, NY*

Experience

Columbia Artificial Intelligence and Robotics Lab (CAIR) **November 2021 - Now**

Part-time Researcher *New York, NY*

- First-authored *Cloth-Funnels: Canonicalized Alignment for Multi-Purpose Garment Manipulation* in collaboration with Toyota Research Institute. Our paper is currently in submission for ICRA 2023, but you can check out some cool robotic unfolding, folding and ironing results at clothfunnels.cs.columbia.edu
- Used modern ML engineering tools such as Ray, Hydra, Weights & Biases, and Pytorch Lightning to create a robust simulation environment that can simultaneously run and train models on multiple GPUs. Learned about research methodology, active research areas in robot learning, and operating real-world UR5 robot hardware.
- Received the Bonomi Scholarship from Columbia University to continue my research over the summer 2022 period.
- Currently doing research on learning robotic manipulation from egocentric videos by leveraging LLMs and VLMs.

Stanford Intelligent and Interactive Autonomous Systems Group (ILIAD) **June 2020 – November 2020**

Research Internship *Stanford, CA*

- Co-authored the paper *Learning Human Objectives from Sequences of Physical Corrections*, published in ICRA 2021. https://arxiv.org/abs/2104.00078
- Experimented with Monte-Carlo methods, GurobiPy and GEKKO to analyze the tradeoffs between random sampling and mixed-integer programming on the trajectory optimization process.
- Created an online environment in Unity WebGL where users interacted with virtual robots equipped with our algorithm. The collected data was passed through a pipeline created with Flask, and stored for later analysis.

Projects

VR Handtracking Whiteboard | *Unity, Oculus, Handtracking* **January 2021**

- Developed a Unity VR app where the user can dynamically create, move, and resize whiteboards (on a real wall if they prefer), and can write on it using their real fingers.
- Published a series of Medium articles about my experience developing this project here

Nexus Virtual Graduation | *Unity, C#, Flask, Google Firebase, HTML/CSS/JS* **May 2020**

- Collaborated with a team on creating a real time multiplayer platform for my high school's virtual graduation experience on Unity. Features include: student avatar creation, free movement around 3d model of the real campus, P2P Real-time spacial voice and video chat, in-game YouTube with adjustable screen, and inter-character interactions such as diploma giving, online event sign-ups.
- Check out our video and website.

LIFE Surveys | *Python, Flask, PostgreSQL, React, Heroku, Google OAuth* **January 2020**

- Created a web-app for my high school dining hall, designed to ensure student-staff feedback through various polls and consequently reduce the food that's thrown away.
- Wrote a scheduled script to scrape the menu from the official website every morning, which stores the feedback data to be reviewed by the designated Food Committee.

Technical Skills

Languages: Python, Java, C#, HTML/CSS, JavaScript, C
Technologies/Frameworks/Tools: PyTorch, PyTorch Lightning, Flask, Unity, Ray, PostgreSQL, Google Firebase, Google OAuth, Grid.AI, Weights & Biases, Git, LaTeX, NumPy, Matplotlib,Linux environment, bash scripting, Seaborn, Pandas, PyBullet

Honors / Awards

NYU Qiskit Quantum Computing Hackathon 2021 - Overall Best Project **Feb 2021**

- My team's quantum computing based strategy based real-time online game "Circuit Showdown" placed 1st in the NYU Qiskit Hackathon 2021.

Columbia DivHacks 2021 - Overall Best Project **Oct 2021**

- Created a dining-hall crowdedness prediction system using web-scraping and machine learning: https://devpost.com/software/ezydine ‘