Cem Gokmen

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Education

Stanford University, Stanford, CA — Jun. 2022 - Present
Ph.D. in Computer Science

- **Advisor:** Prof. Fei-Fei Li
- **Research Interests:** Robot learning, learning from demonstrations, reinforcement learning, computer vision

Stanford University, Stanford, CA — Sep. 2020 - Jun. 2022
M.Sc. in Computer Science — GPA: 4.03

- Google Computer Science Research Mentorship Program (CSRMP) Fellow
- **Select Coursework:** Deep Learning • Principles of Robot Autonomy I • Decision Making Under Uncertainty • Interactive & Embodied Learning • Convolutional Neural Networks for Visual Recognition • Machine Learning with Graphs

Georgia Institute of Technology, Atlanta, GA — Aug. 2016 - Dec. 2018
B.Sc. in Computer Science with Undergraduate Research Certification — GPA: 3.83

Research

Interactive & Embodied Learning
Advised by Prof. Fei-Fei Li, at Stanford Vision & Learning Lab — Jan. 2021 - Present

- Co-created iGibson [Homepage] & BEHAVIOR [Homepage], a simulation environment and a benchmark of common household tasks for embodied AI agents, both accepted to CoRL 2021.
- Working on developing new approaches to different long-horizon robotics problems such as perception, memory, object search, and goal understanding / embedding.
- Currently focused on approaches with graph neural networks on building & planning on scene graphs, as well as graph embeddings of task definitions.

Stochastic Algorithms for Self-Organizing Particle Systems
Advised by Prof. Dana Randall, at GT Algorithms and Randomness Center — Aug. 2017 - Dec. 2018

- Designed algorithms for biomimicry-based swarm intelligence using Markov chain Monte Carlo methods: local, stochastic algorithms that can produce global emergent phenomena such as alignment/flocking, separation, and foraging; with rigorous guarantees of convergence and compatibility with fully distributed agents.

Airborne Measurements of Atmospheric Electricity
Advised by Prof. Morris Cohen, at GT Low Frequency Radio Group — Jan. 2017 - Dec. 2017

- As communications team leader, personally led the development and integrations of sensors such as a Geiger counter, an E-field sensor and a Gamma ray sensor, as well as a reliable telemetry/data collection system and a remote-controlled parachute cutoff system for our high-altitude balloon platform for measuring changes in atmospheric electricity during weather events.

Work Experience

AI Resident, Google [x]
Everyday Robots Project, Mountain View, CA — Jun. 2022 - Present

- Working on increasing success and generalization of learning-from-demonstrations approaches to robotics problems.
- See https://everydayrobots.com/ for public information on this project.

Software Engineer, Google
YouTube Premium Team, San Bruno, CA — Feb. 2019 - Sep. 2020

- Worked on increasing the value of YouTube's paid subscription membership (Premium) by developing new benefits and new strategies to help users make the most of their membership.
- Developed features across YouTube's Python/C++ backends and Android/iOS/Web frontends.

- Primary contributor to free channel memberships for Premium users, which involved three teams in San Francisco and Zurich over 3 quarters. Implemented a variety of critical user journeys and participated in design process, providing domain expertise on in-app messaging methods.
- Code & design contributor to homepage hero promo placements, where personalized Premium benefits are presented in-feed, leading to significantly higher Originals & Music interactions.

Notable Projects

Learning Common Household Skills from Demonstrations
Stanford University • CS 231N Spring 2021

- Built a framework for automatic segmentation of virtual-reality human demonstrations of household tasks in BEHAVIOR into shorter-horizon "skills" involved in completing the task.
- Applied hand-engineered implementations of select skills to show that properly trained skill policies can be used compositionally to replay human demonstrations & proposed a hierarchical RL approach to allow generalization to unseen tasks, scenes and objects.

DeepSponsorBlock: Detecting Sponsored Content in YouTube Videos
Stanford University • CS 230 • github.com/DeepSponsorBlock/DeepSponsorBlock Autumn 2020

- Built a Deep Learning model to detect sponsored segments in YouTube videos using the video's raw frames, using labels from the database of the crowdsourced SponsorBlock project.
- Designed an encoder-decoder architecture with a ResNet50-based encoder and a Bidirectional LSTM decoder to obtain sponsored segment predictions with an impressive 0.69 IOU score.

Photo Filter Identification & Inversion
Georgia Tech, CS 4476 Intro to Computer Vision Fall 2018

- Built a Convolutional Neural Network model that can identify which Instagram filter was applied on a given image (if any) with upwards of 80% accuracy.
- Developed a pseudo-inverter that guesses the unfiltered original image given a filtered image and the filter function, also minimizing quality issues due to color resolution loss from the filter, with mean absolute difference between the inverted and original images under $< 1\%$

Teaching

Course Assistant, CS 107: Computer Organization & Systems
Stanford University Sep. 2020 - Aug. 2021

- Taught labs on C programming and memory for 4 semesters, effectiveness rated 91% by students.

Senior Teaching Assistant, CS 2110: Computer Organization & Programming
Georgia Tech College of Computing Aug. 2017 - Dec. 2018

- Taught 3 hr/week recitation to 75 students each semester with an effectiveness rating of 96%.
- As Senior TA, designed and managed all course materials including homework, lab assignments, exams and lecture activities for 400+ students.
- Planned and directed the major redesign of 6 out of 12 existing homework assignments in order to better highlight course objectives and harness new possibilities arising from new technologies.

Select Publications

S. Srivastava, C. Li, M. Lingelbach, R. Martín-Martín, F. Xia, K. Vainio, Z. Lian, **C. Gokmen**, *et al.*, "BEHAVIOR: Benchmark for Everyday Household Activities in Virtual Interactive ecOlogical enviRonments," in *Conference on Robot Learning (CoRL)*, 2021

C. Li, F. Xia, R. Martín-Martín, M. Lingelbach, S. Srivastava, W. Shen, K. Vainio, **C. Gokmen**, *et al.*, "iGibson v2.0: An object-centric extended simulation for interactive robot learning," in *Conference on Robot Learning (CoRL)*, 2021

S. Cannon, J. J. Daymude, **C. Gokmen**, D. Randall, and A. W. Richa, "A Local Stochastic Algorithm for Separation in Heterogeneous Self-Organizing Particle Systems," in *International Conference on Randomization and Computation (RANDOM)*, 2019

Skills

Languages: English (Fluent), Turkish (Native), French (Advanced), Spanish (Beginner).
Programming Languages: Python, Java, C, C++, JavaScript, Assembly, HTML, CSS, LaTeX.
CS Areas: Robotics, Computer Vision, Deep Learning, Algorithms.