Abrar Anwar

Ph.D Student in Computer Science

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Education

University of Southern California — Los Angeles, CA
Ph.D in Computer Science — Fall 2021 – Present
- Advised by Prof. Jesse Thomason

University of Texas at Austin — Austin, TX
Bachelors of Science in Computer Science — May 2021
- Honors Thesis: *Deep Reinforcement Learning for Optimal Refinement of Cross-Sectional Mesh Sequence Finite Elements*. Advised by Prof. Chandrajit Bajaj

National University of Singapore — Singapore
Exchange Program funded by Gilman Scholarship — Fall 2019

Research Interests

- Human-robot interaction: robots that use anticipatory signals for seamless interactions
- Robot learning: leverage language, vision, etc. for learning how to interact in human environments
- Embodied AI: transfer agents that can interact with simulated environments to real world robots

Research Experience

University of Southern California — August 2021 - Present
Advisor: Prof. Jesse Thomason — *Los Angeles, CA*

Cornell University — May 2022 - July 2022
Visiting Scholar - PI: Prof. Tapo Bhattacharjee — *Ithaca, NY*

Cornell University, Google Research ExploreCSR, UTRGV — June 2021 - August 2021
Research Assistant - PI: Prof. Tapo Bhattacharjee — *Remote*

UT Austin, Building Wide Intelligence Lab — May 2018 - May 2021
Research Assistant - PI: Prof. Peter Stone, Prof. Justin Hart — *Austin, TX*

Sandia National Laboratories — May 2020 - August 2021
Research Intern - PI: Dr. Craig Vineyard — *Albuquerque, NM*

UT's Oden Institute, Computational Visualization Center — April 2020 - May 2021
Undergraduate Thesis - PI: Prof. Chandrajit Bajaj — *Austin, TX*

Sandia National Laboratories — May - July 2019
R&D Autonomy Intern - PI: Dr. James Brad Aimone — *Albuquerque, NM*

Academic Works

[1] Comparative Reasoning for Multi-View Language Grounding
Abrar Anwar, Chancharik Mitra*, Rodolfo Corona*, Dan Klein, Trevor Darrell, Jesse Thomason
(*In Review*) 2023

[2] Human-Robot Commensality: Bite Timing Prediction for Robot-Assisted Feeding in Groups
Janko Ondas*, **Abrar Anwar***, Tong Wu*, Fanjun Bu, Malte Jung, Jorge Ortiz, Tapo Bhattacharjee
CoRL 2022

[3] SEEK: Scoping neuromorphic architecture impact enabling advanced sensing capabilities.
Craig Vineyard, James B. Aimone, **Abrar Anwar**, Ryan Dellana, et al.
Sandia National Labs Technical Report. SAND2022-14058. 2022.

[4] Watch Where You're Going! Gaze and Head Orientation as Predictors for Social Robot Navigation
Blake Holman, **Abrar Anwar**, Akash Singh, Mauricio Tec, Justin Hart, Peter Stone
ICRA 2021

[5] Deep Reinforcement Learning for Optimal Refinement of Cross-Sectional Mesh Sequence Finite Elements
Abrar Anwar
UT Austin Undergraduate Honors Thesis. May 2021

[6] Evolving Spiking Circuit Motifs using Weight Agnostic Networks
Abrar Anwar
AAAI 2021 Undergraduate Consortium

[7] Neural Network Robustness via Binary Activation
William Severa, Craig Vineyard, Ryan Dellana, **Abrar Anwar**
Non-Provisional Utility Patent Application. US 2021/0350236. Sandia National Labs. 2021.

[8] Evolving Spiking Circuit Motifs using Weight Agnostic Networks
Abrar Anwar, Craig Vineyard, William Severa, Srideep Musuvathy, Suma Cardwell.
Sandia Computer Science Research Institute Summer Proceedings. SAND2020-12580R. 2020.

[9] BrainSLAM: Robust autonomous navigation in sensor-deprived contexts
Felix Wang, James B. Aimone, **Abrar Anwar**, and Srideep Musuvathy
Sandia National Labs Technical Report SAND2019-11302R. 2019.

Poster Presentations

[1] Human-Robot Commensality: Bite Timing Prediction for Robot-Assisted Feeding in Groups
Janko Ondas*, **Abrar Anwar***, Tong Wu*, Fanjun Bu, Malte Jung, Jorge Ortiz, Tapo Bhattacharjee
SoCal Robotics Symposium 2022

[2] Nonverbal Behavior Generation in Social Bite Timing
Abrar Anwar, Tapomayukh Bhattacharjee
Google Research exploreCSR & UTRGV Poster Session. July 2021.

[3] Do you see what I see? Gaze understanding in people, 3D-rendered robot heads, and virtual reality
Akash Singh, **Abrar Anwar**, Justin Hart
UT Undergraduate Research Forum. April 2021. **(Best CS Poster)**

[4] Watch Where You're Going! Gaze and Head Orientation as Predictors for Social Robot Navigation
Blake Holman, **Abrar Anwar**, et al.
UT Undergraduate Research Forum. April 2021.

[5] Evolving Spiking Circuit Motifs using Weight Agnostic Neural Networks
Abrar Anwar et al.
ACM International Conference on Neuromorphic Systems (ICONS). July 2020.

[6] Using Human-Inspired Signals to Disambiguate Navigational Intentions
Abrar Anwar, Blake Holman, Connor Sheehan, Jeffery Huang
UT Undergraduate Research Forum. April 2020.

[7] Bounding Box SLAM: A Fast, Selective SLAM
Abrar Anwar, Blake Holman, Michail Shaposhnikov
UT Undergraduate Research Forum. April 2019.

Press

USC Robotics Open House 2023. USC Viterbi. 2023.
Robot that learns social cues could feed people with tetraplegia. NewScientist. 2022.

Awards, Honors & Recognition

- Horatio Alger Graduate Scholar (100k fellowship). Winner out of 89 applicants. 2023
- NSF GRFP Honorable Mention 2023
- Research Distinction, UT Austin College of Natural Sciences - top 5% of UT seniors in research 2021
- CNS Award for Excellence in Computer Science ($500) - Undergraduate Research Forum, UT Austin 2021
- Google Computer Science Research Mentorship Program (CSRMP) Class of 2021 2021
- AAAI Undergraduate Consortium - 1 of 14 accepted out of 82 applicants 2021
- Benjamin A. Gilman International Scholar (Singapore) Fall 2019
- Horatio Alger Honeywell Scholar 2017-21

Technical Skills

Languages: Python, C/C++, MATLAB, Java, R, JavaScript, C#, LaTeX
Technologies: PyTorch, Tensorflow, Pandas, ROS, sklearn, OpenCV, OpenAI Gym, Unity, OpenMPI