Joshua Feinglass

I'm a 4th year PhD student developing **generalizable** and **robust** models to ensure the deployment of safe and reliable AI systems.

I work in the ASU APG lab where I'm advised by Yezhou Yang. I am currently interning at Lawrence Livermore National Lab, where we're developing novel zero-shot deep learning architectures using image and natural language data sources.

I previously worked full-time as a Senior Digital Signal Processing Engineering at General Dynamics where I designed algorithms for spectral decomposition, detection, characterization, and classification of communication and radar signals.

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Google Scholar
Curriculum Vitae (PDF)
Github
Linkedin

Education

Aug. 2019 — Dec. 2023 **Ph.D. in Computer Engineering w/ Machine Learning Specialization**
Arizona State University, Tempe, AZ
Advisor: Yezhou Yang

Aug. 2016 — May 2018 **M.S. in Computer Engineering w/ Machine Learning Specialization**
Arizona State University, Tempe, AZ
GPA: 3.93/4.00

Aug. 2012 — May. 2016 **B.S. in Computer Science**
Arizona State University, Tempe, AZ
GPA: 3.85/4.00

Work and Research Experience

May 2021 — Present **Lawrence Livermore National Lab**, Livermore, CA
Graduate Research Intern, Computing at LLNL
Mentor: Jayaraman Thiagarajan, Rushil Anirudh, Jayram Thathachar
Developed highly generalizable Zero-Shot Learning architecture with novel regularization techniques, a pre-trained vision pipeline, and external knowledge retrieval.

May 2018 — Dec. 2019 **General Dynamics Mission Systems**, Scottsdale, AZ
Senior Digital Signal Processing Engineer, Trusted Space Solutions

Created specifications for the standard operation and packet-level communication of devices in an edge computing framework. Developed algorithms for detecting communication and radar signals of interest and estimating their time and frequency characteristics for downstream decoding, classification, and localization tasks. Automated and optimized the creation of data compression pipelines for efficient communication channels and downstream data visualization tasks based on project requirements.

Jan. 2020 — Present
Arizona State University, Tempe, AZ
PhD Researcher, Active Perception Group
Mentor: Yezhou Yang
Exploring concepts like knowledge representation/extraction, model generalization/robustness, and inference consistency/evaluation in Natural Language and Image Processing applications. Sole first author of a novel information theory based evaluation of captions for semantics and fluency presented in ACL 2021 (Oral). First author of two follow-on works which fundamentally redefine evaluation approaches in object detection and model generalization/robustness (an early draft of the robustness work will be presented in a NeurIPS 2022 workshop).

Jan. 2017 — Dec. 2017
Arizona State University, Tempe, AZ
Master's Research Assistant, Image, Video, and Usability (IVU) Lab
Mentor: Lina Karam
Built software frameworks using C, Python, OpenCV, Ada, and Matlab on a Linux platform for data acquisition and signal processing on the Soli radar device. Developed biometric and gesture detection/estimation algorithms using machine learning, sensor fusion, feature point tracking, beamforming, spectral analysis and pattern recognition algorithms on Photoplethysmographic (PPG) and Frequency-Modulated Continuous-Wave (FMCW) signal information.

May 2016 — Aug. 2016
Honeywell, Phoenix, AZ
Intern, Test Services
Mentor: Craig Stevens, Bob Apodaca
Refined MySQL/PHP/HTML/CSS/JavaScript-based web applications for employee records and schedules.

May 2015 — Aug. 2015
Honeywell, Phoenix, AZ
Intern, Test Services
Mentor: Craig Stevens, Bob Apodaca
Updated software and hardware logic programs for automated engine tests.

Publications

Covariate Shift Detection via Domain Interpolation Sensitivity
Tejas Gokhale*, Joshua Feinglass*, Yezhou Yang
NeurIPS 2022 Workshop INTERPOLATE (NeurIPS Workshop). New Orleans, LA, 2022.
Project BibTeX * Authors contributed equally

SMURF: SeMantic and linguistic UndeRstanding Fusion for Caption Evaluation via Typicality Analysis
Joshua Feinglass, Yezhou Yang
Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics (ACL). Online, 2021.
Project BibTeX

Gameability of Object Proposal Evaluation
Joshua Feinglass, Yezhou Yang
(UNDER REVIEW). 2022.

Talks

Covariate Shift Detection via Domain Interpolation Sensitivity
Dec. 2022 NeurIPS 2022 Workshop INTERPOLATE

Recognizing Unseen Classes with Part-Whole Prototypes
Aug. 2022 Summer SLAM at Lawrence Livermore National Lab

Identifying Features of Out-of-Distribution Examples and their ties to Improved Evaluation of Generation Tasks
Apr. 2022 Cognition and Intelligence Lab at ASU

SMURF: SeMantic and linguistic UndeRstanding Fusion for Caption Evaluation via Typicality Analysis
Aug. 2021 ACL 2021