

Arjun Subramonian (they/them)

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Research Interests

graph machine learning, natural language processing, fairness, privacy, ethics, efficiency

Education

PhD in Computer Science; University of California, Los Angeles (2021-2026), Eugene V. Cota-Robles Fellow, *GPA*: 4.0

Advisors: Yizhou Sun, Kai-Wei Chang

BS in Computer Science; University of California, Los Angeles (2018-2021), *GPA*: 3.927, Summa Cum Laude

Work Experience

Machine Learning Researcher, UCLA Scalable Analytics Institute (2019-)

Location: Los Angeles, California

Machine Learning Researcher, UCLA NLP (2020-)

Location: Los Angeles, California

Research Engineering Intern, AllenNLP, Allen Institute for Artificial Intelligence (2021)

Location: Seattle, Washington

Description: I developed [AllenNLP's fairness library](#), which makes fairness metrics, training-time fairness algorithms, bias mitigation algorithms, and bias metrics accessible to researchers and practitioners of all levels. I also wrote a [guide chapter](#), [documentation](#), and a [blog post](#) to communicate my work and make usage of the fairness library accessible.

Privacy Research Intern, Snap, Inc. (2021)

Location: Los Angeles, California

Description: I developed algorithms to improve the safety of friend suggestions for underage users on Snapchat while preserving the privacy of all users. I further contributed to the development of Snap's Responsible AI principles. I also worked on machine learning for ads and monetization.

Software Engineering Intern, Microsoft Corporation (2020)

Location: Sunnyvale, California

Description: I crafted a peer-to-peer-anonymous, secure backend technical design for a feature to report harassment on Microsoft Teams.

Software Engineering Intern, Get Heal, Inc. (2019)

Location: Los Angeles, California

Description: I engineered full-stack integrations of mechanisms used every day at Heal that enhance the automated routing of medical providers, like automated triaging, doctor-assistant match prevention, and phone number verification. I also adapted Heal's automated routing algorithm to optimally schedule telemedicine visits, which greatly benefits patients during the COVID-19 pandemic.

Deep Learning Engineer, Sike AI (2018-2019)

Location: Los Angeles, California

Description: I designed, implemented, and trained the in-house deep learning model for working style-analysis from video with TensorFlow.

Publications

Dev, Sunipa, Masoud Monajatipoor*, Anaelia Ovalle*, **Arjun Subramonian***, Jeff M Phillips, and Kai-Wei Chang. "**Harms of Gender Exclusivity and Challenges in Non-Binary Representation in Language Technologies.**" Accepted to EMNLP 2021 (Oral – 9.8% acceptance rate), WiML Un-Workshop @ NeurIPS 2021.

Subramonian, Arjun. "**Fairness and Bias Mitigation: A practical guide into the AllenNLP Fairness module.**"

Zhang, Shichang, Ziniu Hu, **Arjun Subramonian**, and Yizhou Sun. "**Motif-Driven Contrastive Learning of Graph Representations.**" Accepted to SSL@WWW2021.

Subramonian, Arjun. "**MOTIF-Driven Contrastive Learning of Graph Representations.**" Accepted to Undergraduate Consortium @ AAAI 2021.

Brown, Calvin, Derek Tseng, Paige M. K. Larkin, Susan Realegeno, Leanne Mortimer, **Arjun Subramonian**, Dino Di Carlo, Omai B. Garner, and Aydogan Ozcan. "**Automated, Cost-Effective Optical System for Accelerated Antimicrobial Susceptibility Testing (AST) Using Deep Learning.**" ACS Photonics 2020 7 (9), 2527-2538 DOI: 10.1021/acsp Photonics.0c00841

Crandall, Sara, Graeme H. Smith, **Arjun Subramonian**, Kelly Ho, and Evelyn M. Cochrane, "**Estimating the Ages of FGK Dwarf Stars Through the Use of GALEX FUV Magnitudes.**" Astronomical Journal 2020 160, 217, DOI: <https://doi.org/10.3847/1538-3881/abb77d>

QueerInAI, Organizers of, A Pranav, MaryLena Bleile, **Arjun Subramonian**, Luca Soldaini, Danica Sutherland, Sabine Weber, Pan Xu, William Agnew, Michael McKenna, and Nyx McLean. "**How to Make Virtual Conferences Queer-Friendly: A Guide.**" Accepted to WiNLP 2021 Workshop @ EMNLP 2021.

Subramonian, Arjun. "**Queer | Inclusive | Badass.**" Accepted to Resistance AI Workshop @ NeurIPS 2020.

Invited Talks and Panels

2022 - Prioritizing Grassroots D&I Activism: Queer in AI, AAAI 2022 Workshop on Diversity in Artificial Intelligence

2022 - Prioritizing Grassroots D&I Activism: Queer in AI and "How Do We Improve DEI in AI?" Panel, Nike Sport+AI Conference

2022 - Rebuilding Trust: Making Artificial Intelligence Queer-Inclusive, QWER Hacks 2022

2021 - Eye on A.I.: Equity & Inclusion in A.I. Technology, Toronto Public Library

2021 - ACM AI at UCLA Research Panel, UCLA

2021 - Harms of Gender Exclusivity and Challenges in Non-Binary Representation in Language Technologies, EMNLP 2021

2021 - Safer Privacy-Preserving Friend Suggestions, Snap, Inc.

2021 - Machine Learning Justice, Catalysts for Change

2021 - How Can I Make My Hackathon Queer-Inclusive? (Slides, Video), Hackcon IX

2021 - Intersectionality Panel, NAACL 2021

2021 - Queer in AI Inclusive Conference Guide DEI Update, Allen Institute for Artificial Intelligence

2021 - Queer in AI Panel, UCLA

2020 - Fair Machine Learning, Microsoft Garage Brown-Bag

2019 - An Automated and Cost-Effective System for Early Antimicrobial Susceptibility Testing Using Optical Fibers and Deep Learning, UCLA HHMI Day 2019

Honors and Awards

2022 - [AI2 Outstanding Intern of the Year Award](#) (1 of 3 interns recognized)
2021 - [MLH Top 50 Class of 2021](#)
2021 - [UCLA Samueli School-Wide Outstanding Bachelor of Science](#)
2021 - UCLA Chancellor's Service Award
2021 - UCLA Samueli Engineering Achievement Award in Student Welfare
2021 - Eugene V. Cota-Robles Fellowship, UCLA
2021 - Graduate Research Assistantship, UCLA
2021 - Boeing Company Scholarship, UCLA
2021 - Brian J. Lewis Endowment, UCLA
2020 - [Computing Research Association Outstanding Undergraduate Researcher Honorable Mention](#)
2020 - [AAAI Undergraduate Consortium](#) (1 of 14 accepted out of 82 applicants)
2020 - IBM Quantum Challenge (1 of 574 winners out of 1745 participants)
2020 - Out for Undergrad Tech Conference (1 of 300 accepted applicants)
2020 - Google Queer Tech Voices Conference (1 of 32 accepted out of hundreds of applicants)
2019 - 3rd Place Award for Best Hack @ Rose Hack, Major League Hacking
2018-2021 - Dean's Honors List
2017 - Siemens Competition Regional Finalist (1 of 101 finalists selected from 4092 entrants)
2016 - Award of Achievement, Association for Computing Machinery, San Francisco Bay Area Professional Chapter

Ongoing Research Projects

Graph Condensation for Efficient Graph Neural Network Training (2021-)

Collaborators: Harsh Chobisa, Yizhou Sun, Baharan Mirzasoleiman

Location: UCLA Scalable Analytics Institute

Description: We are developing algorithms to condense large networks into small, synthetic graphs that, when used to train a graph neural network, can yield comparable test performance with more efficient training.

Species Reidentification via Graph Machine Learning (2021-)

Collaborators: Sara Beery, Chuck Stewart, Shane Lubold, Peter Kulits, Jake Wall

Location: Caltech Computational Vision Laboratory

Description: I am applying graph machine learning to elephant co-sightings to contextualize and improve elephant reidentification.

Analyzing Biases via Attention Flows (2021-)

Collaborators: Sunipa Dev, Kai-Wei Chang

Location: UCLA NLP

Description: I am exploring how attention flows in large language models correlate with bias metrics and are affected by bias mitigation.

Expressive Graph Transformers (2020-)

Collaborators: Yizhou Sun

Location: UCLA Scalable Analytics Institute

Description: I am empirically and theoretically studying the effect of different types of handcrafted and adaptive relational information for relation-aware self-attention on improving the expressiveness and performance of graph Transformers, particularly on NP-hard graph problems. As part of this project, I implemented and trained a multi-GPU graph Transformer model using PyTorch. I am also theoretically analyzing the logical expressiveness of graph Transformers.

Learning Fair Node Representations (2020-)

Collaborators: Kai-Wei Chang, Yizhou Sun

Locations: UCLA NLP, UCLA Scalable Analytics Institute

Description: I am researching interpretable methods to provably debias pretrained graph convolutional networks (GCN) and learn fair

node representations for social networks and knowledge graphs without demographics and under feature imputation.

Relevant Course Projects

Twitter Saliency Algorithm: Identifying Unintentional Harms to Gender Non-Conforming Individuals (2021)

Collaborators: Michael McKenna

Description: We attempted to uncover unintentional harms of the Twitter saliency algorithm, e.g. 1) identifies images of potentially-cis or binary-presenting individuals as more salient than those of gender non-conforming folks, 2) identifies undesirable secondary sex characteristics of gender non-conforming individuals that may trigger body dysphoria.

Notes: [Report](#)

Heterogeneous Graph Transformer (2020)

Collaborators: Ziniu Hu, Yizhou Sun

Location: UCLA Scalable Analytics Institute

Description: I adapted the implementation of the Heterogeneous Graph Transformer (HGT) to efficiently embed web-scale knowledge graphs (e.g. YAGO, DBpedia) for link prediction and ran R-GCN baselines. Additionally, I prepared an OGB leaderboard submission in which I applied HGT to the ogbl-ppa dataset.

Robust Model-Agnostic Meta-Learning for Binary Content Moderation Tasks in Natural Language Processing (2020)

Collaborators: John Dang, Kai-Wei Chang

Location: University of California, Los Angeles

Description: We investigated applying Model-Agnostic Meta-Learning (MAML) to boost performance on binary content moderation tasks in low-resource contexts. Using PyTorch, we compared the ability of a model pre-trained with MAML to adapt to unseen binary content moderation tasks to those of a model pre-trained using traditional transfer learning approaches and a model trained from scratch.

Notes: [Report](#)

MovieLens Recommender System (2019)

Collaborators: Amit Mondal, Bryan Chiang, John Dang, Jyun-Yu Jiang, Wei Wang

Location: University of California, Los Angeles

Description: We created a recommender system to predict the binary rating for 4M unseen UserID-MovieID pairs in the MovieLens dataset. We surveyed the performance of content-based (e.g. TF-IDF, genre-based decision tree, etc.) and collaborative filtering (e.g. SVM, SVD, element-wise matrix factorization, tabular matrix factorization, hybrid matrix factorization, etc.) methods. **We achieved the third highest ROC-AUC on the test set in our data mining class.**

Notes: [Report](#)

Service

Reviewing (2022-)

Description: I was/am a reviewer for: [FAccT 2022](#), [TrustNLP @ NAACL 2022](#), [Challenges & Perspectives in Creating Large Language Models @ ACL 2022](#)

Affinity Workshops Chair, NAACL 2022 (2022)

Location: New Orleans, Louisiana

Description: I am serving as an Affinity Workshops Chair for [NeurIPS 2022](#).

Core Organizer, Queer in AI (2021-)

Location: Virtual

Description: I organize workshops and socials at AI conferences (e.g. [AAAI-21](#), [ICML '21](#), [NeurIPS 2021](#)), as well as the [undergraduate mentoring program](#), which gets junior queer and trans folks involved with AI research and aids them in [applying to graduate school](#). Additionally, I advise AI conferences on [diversity and inclusion and accessibility issues](#), hire researchers and administrators, and help

shape [AI policy](#) as it concerns queer and trans communities. The work I do with Queer in AI has been featured by [500 Queer Scientists](#).

Accessibility Chair, NAACL 2022 (2021-2022)

Location: Seattle, Washington

Description: I am serving as an Accessibility Chair on [NAACL 2022's Diversity and Inclusion committee](#), ensuring in-person and digital accessibility for the conference. I authored guidelines on: [Publication Accessibility, Quality, and Inclusivity](#).

Queer and Trans in STEM Representative, UCLA Samueli Standing Committee on Diversity (2021-)

Location: University of California, Los Angeles

Description: I am working towards dropping the GRE requirement for graduate school admissions.

UCLA Engineering Scholarship Application Reviewer (2021)

AllenNLP Hacks Organizer, AllenNLP (2021)

Location: Seattle, Washington

Description: I helped organize [AllenNLP Hacks](#), a hackathon to connect with marginalized students, welcome them into AllenNLP's open-source community, bring their perspectives to AllenNLP's research, and encourage them to apply to intern and work with [AllenNLP](#).

Organizer, UCLA Computer Science Summer Institute (2021)

Location: Los Angeles, California

Description: I interviewed and recruited a diverse group of Undergraduate Tutors for the inaugural [UCLA Computer Science Summer Institute \(CSSI\)](#) to lead interactive coding and problem-solving sessions with the high school students.

Outreach Director, ACM AI at UCLA (2019-2021)

Location: Los Angeles, California

Description: I strive to make an [AI education](#) accessible to everyone. I created, led, and taught open-source, accessible [machine learning](#) and [AI ethics](#) classes at Title I schools in LA, through in-person visits, virtual sessions, and educational technology (e.g. [mean-squared error](#), [convolutional filters](#), [biases in machine learning](#), etc.) I also created and produced the "[You Belong in AI!](#)" podcast, which empowers marginalized youth to pursue AI opportunities through inspiring interviews with researchers. The podcast has been featured by the [Daily Bruin](#) and [UCLA Samueli Newsroom](#).

Co-Founder and Organizer, QWER Hacks (2019-2021)

Location: Los Angeles, California

Description: I co-founded and organized Major League Hacking's first-ever LGBTQIA+ event and the first student-run, collegiate [LGBTQIA+ hackathon](#) in the US. QWER Hacks has been featured by the [Daily Bruin](#) and the [UCLA Samueli Newsroom](#).

Undergraduate Learning Assistant (2018)

Location: Los Angeles, California

Description: I led weekly recitation sections of 20 students for the introductory computer science class (programming in C++), walking through practice problems and actively applying pedagogy techniques (e.g. open questioning, fostering belonging, etc.)

Relevant Coursework and Skills

Relevant Coursework: Fairness, Ethics, Accountability and Transparency in Natural Language Processing; Neural Networks and Deep Learning; Large-Scale Machine Learning

Relevant Skills: Python, PyTorch, PyTorch Geometric, git, shell scripting, LaTeX

References

Yizhou Sun (yzsun@cs.ucla.edu)

Kai-Wei Chang (kwchang@cs.ucla.edu)

Aydogan Ozcan (ozcan@ucla.edu)