

# Jay Shah

Ph.D. student

Arizona State University

Email: [jgshah1@asu.edu](mailto:jgshah1@asu.edu)

Homepage: <https://www.public.asu.edu/~jgshah1/>

[in](#) [shahjay22](#) | [tw](#) [jaygshah22](#) | [gh](#): [jaygshah](#)

**Research Objectives:** Leveraging Deep Learning (DL) to develop novel techniques for biomarker discovery built for tackling few of the most common challenges in healthcare research (a) Small datasets (b) Noisy and imbalanced datasets (c) Lack of explainability of complex model predictions. Aim of my research is to build innovative Interpretable techniques that can help democratize use of AI within other fields.

I work with [Dr. Teresa Wu](#) and [Dr. Baoxin Li](#) on medical imaging projects relating to biomarker discovery for Post-Traumatic Headache (PTH) and Alzheimer's Disease (AD) using Deep Learning in joint collaborations with Mayo Clinic, Banner Alzheimer's Institute and Barrow Neurological Institute in Arizona, USA.

## EDUCATION

<b>Ph.D. in Computer Science</b> , Arizona State University	05/2020 - Present
<b>M.S. in Computer Science</b> , Arizona State University	08/2018 - 05/2020
<b>B.Tech in Information &amp; Communication Technology</b> , Dhirubhai Ambani Institute of Information and Communication Technology	08/2014 - 08/2018

## WORK EXPERIENCE

<b>Mayo Clinic, Arizona</b> Research Affiliate and Doctoral student	05/2020 - Present
<b>Arizona State University, Tempe</b> Worked with <a href="#">Frank Wilczek</a> , Nobel Laureate and Professor of Physics, on using Machine Learning (ML) for Art Authentication & Teaching Assistant in Dept. of Computer Science	12/2018 - 05/2020
<b>Philips Research Labs, Cambridge</b> Research & Development Intern, worked on contactless patient monitoring and vitals measurement tool using DL techniques	06/2019 - 08/2019
<b>HackerRank, Bangalore</b> Machine Learning Engineer Intern, built real-time systems for platform and user feedback monitoring using ML and coding challenges for ML interviews	01/2018 - 05/2018
<b>Nanyang Technological University, Singapore</b> Visiting Undergraduate Research Intern, worked with Professor Lin Weisi in exploring significance based large scale 3D point cloud compression and representation.	05/2017 - 08/2017

## RESEARCH PROJECTS

### Identifying biomarkers for Persistence of PTH using Deep Learning

Building multi-modal deep learning models to identify and predict mechanisms and signature to prevent persistence of PTH using Transformers and CNN based techniques. Also exploring Shapley Value based methods for delineating model predictions for better interpretation and clinical usage (*collaboration with ASU and Mayo Clinic, Arizona*)

### Missing modality harmonization using Deep Learning for longitudinal studies in Alzheimer's

Harmonizing PET imaging data from different scanners and modalities to generate compatible imaging derived measurements using encoder-decoder architectures. Aim is to address tracer harmonization problem and support longitudinal studies in Alzheimer's research (*collaboration with ASU and Banner Alzheimer's Institute, Arizona*)

### Personalized Diagnostics and Prognostics for Alzheimer's Disease using Machine Learning

DL based tools for brain age prediction, (AD) classification, conversion of mild cognitive impairment (MCI) to AD and building personalized diagnostics using multi-modal data from various sensors (*STTR grant with ASU and MS-Tech*)

## JOURNAL PUBLICATIONS

1. (*1st revision submitted*) **Shah, J.**, Fao, F. Zhou, Y., Ghisays, V., Luo, J., Chen, Y., Lee, W., Li B., Benzinger, T., Reiman, E., Chen, K., Su, Y., Wu, T., “Deep Residual Inception Encoded-Decoder Network for Amyloid PET Harmonization”, *Alzheimer’s and Dementia Journal*.
2. (*Ongoing revision*) Siddiquee, M., **Shah, J.**, Chong, C., Schwedt, T., Ross, K., Dumkrieger, Wu, T., “Using Deep Learning Ensembles to identify Imaging Biomarkers for Post-Traumatic Headache”, *Cephalalgia Journal*.

## Conferences & Abstracts

1. (Abstract) **Shah, J.**, Ghisays, V., Luo, J., Chen, Y., Lee, W., Li B., Benzinger, T., Reiman, E., Chen, K., Su, Y., Wu, T., “Deep Residual Inception Encoded-Decoder Network for Amyloid PET Harmonization”, *Arizona Alzheimer’s Consortium, 2021*.
2. (Abstract) **Shah, J.**, Chong, C., Schwedt, T., Berisha, V., Li, J., Ross, K., Dumkrieger, G., Zhang, J., Gaw, N., Nikolova, S., Wu, T., “Interpreting Deep Learning Model Predictions using Shapley Values”, *INFORMS Annual Meeting, 2021*.
3. [\[link\]](#) **Shah, J.**, Ghisays, V., Luo, J., Chen, Y., Lee, W., Li B., Benzinger, T., Reiman, E., Chen, K., Su, Y., Wu, T., “Deep Residual Inception Encoded-Decoder Network for Amyloid PET Harmonization”, *Alzheimer’s Association International Conference, 2021*.

## GRANTS & AWARDS

IEEE Impact Creator Award <a href="#">[link]</a>	01/2021
Alzheimer’s Association International Conference 2021, Travel Fellowship	06/2021
Graduate Research Assistantship, Arizona State University	05/2020 – Present
CVPR 2019, Travel Grant	06/2019
IEEE-IAS Annual Meeting Ex-Com, Travel Grant (US\$1200 p.a., 3 years)	2017 - 2019

## INVITED TALKS AND HIGHLIGHTS

Alzheimer’s Imaging Consortium Spotlight Webinar, Neuroimaging PIA	10/2021
Deep Residual Inception Encoded-Decoder Network for Amyloid PET Harmonization	
Emerging Research Topics in Engineering, IEEE Gujarat Section <a href="#">[link]</a>	10/2021
Landscape of Interpretable AI, its limitations and glance at Shapley Values	
4 <sup>th</sup> OnCV&AI workshop, Nordling Lab, National Cheng Kung University in Taiwan <a href="#">[link]</a>	09/2021
Landscape of Explainable AI, interpreting DL predictions and observations from hosting an ML podcast	
Dhirubhai Ambani Institute of Information and Communication Technology Blog <a href="#">[link]</a>	
From DAIICT to ASU and working with Nobel Laureate Frank Wilczek	
AXIOS news article <a href="#">[link]</a>	
How AI could revolutionize biology-and vice versa	
IEEE Spectrum and Career Reset Podcast <a href="#">[link1]</a> , <a href="#">[link2]</a>	04/2021
Scaling up a technical podcast	
Curru Leadership Podcast <a href="#">[link]</a>	04/2021
Behind the scenes with Machine Learning Expert	
Workshops at AI Club, ASU	
Python workshop <a href="#">2020</a> , Convolutional Neural Networks <a href="#">2020</a> , <a href="#">2021</a>	

## TECHNICAL SKILLS AND COURSEWORK

**Programming Languages:** Python, C/C++, Java, matlab, SQL, Shell Scripting

**ML/DL frameworks:** PyTorch, TensorFlow, R-Studio, Tableau, Gephi, scikit-learn, NLTK, OpenCV

**Web Technologies:** html, css, javascript, d3, Google Compute and App Engines, AWS, MySQL, PostgreSQL

Human-Aware AI, Intro to ML, Fund. of Statistical Learning, Neural Networks, Intro to Digital Image Proc, Game Theory, NLP, Vision & Language frontier, Data Mining and Vis, Social Media Mining, Dist. & Parallel Database Systems, Stochastic Simulation, Discrete Math, Calculus & Complex Variables, Algebraic Structures, Prob & Stats, Cloud Computing, GPU Programming, Data-Structures & Algorithms, Obj. Oriented Prog, Theoretical Computer Science, OS, Compiler Design

## LEADERSHIP ACTIVITIES

Machine Learning Podcast Host (3,020+ subscribers, 100,000+ downloads) <a href="#">[link]</a>	01/2019 - Present
Research Associate, ASU-Mayo Center for Innovative Imaging <a href="#">[link]</a>	05/2020 - Present
IEEE-IAS Subcommittee Chair	08/2018 - Present
Technical Director, AI Club, ASU	01/2020 - Present
Chairperson, IEEE-IAS DAIICT (Student Branch Chapter)	01/2017 – 12/2017