

Jayanth Shreekumar

Purdue University, West Lafayette

Interested in computer vision, time series, and causal AI.

Advisor: Qiang Qiu

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Education

PhD in Electrical and Computer Engineering

Purdue University

• GPA : **3.94** / 4.0 • [Transcript](#)

Dec 2028

• Research Area: Computer Vision and Time Series Modelling for UAVs

MS in Electrical and Computer Engineering

UCLA

• MS by Project • GPA : **3.93** / 4.0 • [Transcript](#)

Dec 2023

• Project title: Efficient Codes for Quantum Key Distribution

[Report](#) [Slides](#)

BTech in Electronics and Communication Engineering

PES University

• Minor in Computer Science • GPA : **9.41** / 10.0 • [Transcript](#)

Jul 2020

• Project title: Improved Viseme Recognition using Generative Adversarial Networks

[Report](#)

Academic Experience

Graduate Research Fellow

Purdue

AIDA³ Research Center

Aug 2024 - Present

- Currently working on anomaly detection for engine health monitoring using VAEs for sensor reconstruction and interventional simulation experiments.
- Previously worked on creating novel deep learning based computer vision algorithms for estimation of human mental states. Utilized Theta-Alpha ratio (TAR), an EEG derived ground truth, to model working memory engagement as a continuous, autoregressive time series with exogenous ocular features.
- Created a novel wavelet-based transformer for accurate autoregressive prediction of TAR.
- Paper titled "NARCOX: Non-Stationary Auto-Regressive Transformers for Cognitive Modeling with Ocular Exogenous Input" published at Neurocomputing.
- Skills Utilized: • Deep Learning • Pytorch • Time Series Modelling • Cognitive load theory

Graduate Student Researcher

UCLA

Laboratory for Robust Information Systems (LORIS)

Jun 2023 - Dec 2023

- Worked on quantum key distribution - a secure communication protocol for information reconciliation between two users.
- Utilized LDPC codes to perform efficient decoding of information. Used Slepian Wolf coding and multi-layer coding scheme to perform layer-wise decoding for increased performance.
- Implemented simulated annealing to find the optimal set of parameters.
- Modelled the quantum key distribution channel using probability, linear algebra, and machine learning as a mixture of two Gaussians and a uniform distribution.
- Wrote bash scripts to run simulations on the UCLA Hoffman supercomputer.
- Second author for a journal paper that is pending review currently.
- Skills Utilized: • Python • C++ • Bash • Probability • Linear Algebra • Error Correction Coding

Graduate Teaching Assistant

UCLA

Electrical and Computer Engineering Department

Apr 2022 - Dec 2023

- GTA for 5 quarters, teaching 4 different courses • Probability & Statistics • Data Science • Data Storage Systems • Electromagnetic Waves.
- Responsible for holding discussion sections that focused on problem solving and for holding office hours. Created and graded homeworks, examinations, and projects.

- Sample evaluations: [Evaluations](#)
- Skills utilized: · Python · MATLAB · L^AT_EX

Graduate Student Researcher

UCLA

Department of Radiation Oncology

Oct 2022 – Nov 2022

- Image registration of MRI images. Generated a demo dataset to perform training of LAPNet network that automatically finds motion field vectors between two successive MRI images.
- Used the Local All-Pass (LAP) estimation technique to obtain motion field vectors between MRI slices to use for training.

Industry Experience

Advanced Micro Devices (AMD)

Austin, TX

Performance Engineering Intern

Jun 2022 – Sep 2022

- Benchmarked 3rd gen AMD EPYC Milan processors for machine learning workloads.
- Worked on the TPCx-AI single node machine learning benchmark and MLPerf DLRM Recommendation Inference benchmark.
- Performed system and BIOS tuning leading to a benchmark performance increase of 10% on the TPCx-AI benchmark. Simultaneously modified system hardware configurations without sacrificing performance, leading to a decrease in system cost.
- Distributed DLRM benchmark workload across 64 cores of the processor for increased efficiency.
- Completed the AMD EPYC certification course that covered topics on data centers, AMD CPUs and GPUs, and EPYC processor architecture and features.
- Skills utilized: · Python · Bash · Jira · GitHub

Perfios Software Solutions Private Limited

Bangalore, India

Data Science and Machine Learning Intern

Jan 2021 – Jul 2021

- Worked on automatic table structure recognition of bank statements using deep learning to convert images to more machine readable formats like a CSV.
- Developed a sampling algorithm for efficient training of graph neural networks on bank statements.
- Built an inference pipeline from scratch to test the network on new image samples.
- Applied Tesseract OCR to extract language features from images and used it along with image features extracted from a CNN as training input for the graph neural network.
- Used precision and accuracy to measure model performance and presented findings.
- Skills utilized: · Python · Tensorflow · Numpy · Deep Learning

Technical Skills

Programming Languages : Python · C++ · JavaScript · C

Data Science : PyTorch · Tensorflow · OpenCV · Scikit-Learn · Numpy · Pandas

Tools : Matlab · Arduino · L^AT_EX · Tableau · Bash · OpenCV

Others : MongoDB · MySQL · Linux · Git

Publications

1. Jayanth Shreekumar, Qiang Qiu, Sabine Brunswicker, "NARCOX: Non-stationary auto-regressive transformers for cognitive modeling with ocular exogenous input", Neurocomputing, Volume 678, 2026, 133118, ISSN 0925-2312, [10.1016/j.neucom.2026.133118](#).
2. Jayanth Shreekumar, Ganesh K Shet, Vijay P N, Preethi S J and Niranjana Krupa, "Improved Viseme Recognition using Generative Adversarial Networks," 2020 IEEE REGION 10 CONFERENCE (TENCON), 2020, pp. 1118-1123, doi: [10.1109/TENCON50793.2020.9293784](#).
3. Mitra, Debarnab & Shreekumar, Jayanth & Tauz, Lev & Sarihan, Murat & Wong, Chee & Dolecek, Lara. (2023). "Efficient Information Reconciliation in Quantum Key Distribution Systems

Using Informed Design of Non-Binary LDPC Codes", doi: [10.1007/s11128-024-04343-8](https://doi.org/10.1007/s11128-024-04343-8).

4. L. Tauz, D. Mitra, J. Shree Kumar, M. C. Sarihan, C. W. Wong and L. Dolecek, "Block-MDS QC-LDPC Codes with Application to High-Dimensional Quantum Key Distribution," 2024 IEEE Information Theory Workshop (ITW) 2024, pp. 199-204, doi: [10.1109/ITW61385.2024.10806945](https://doi.org/10.1109/ITW61385.2024.10806945).

Selected Projects

Classification of Imagined Movement with EEG Signals Apr 2022 - Jun 2022

- Goal was to predict imagined movements from raw electroencephalogram data signals taken from 22 electrodes extracting neural data.
- Worked with a wide variety of models ranging from standard CNNs and LSTMs, to spatio-temporal CNNs, GANs, and Transformers.
- The Spatio-Temporal CNN with LSTM performed the best with an accuracy of 74.7%.
- Skills utilized: · Python · PyTorch · Deep Learning [Code](#)

Twitter Data Mining Jan 2022 - Apr 2022

- Crawled tweets about the Superbowl game between Patriots and Sea Hawks and performed lemmatization, feature extraction, dimensionality reduction, and obtained word embeddings.
- Built L1, L2, random forest, and perceptron classifiers to predict fan base of tweets (classification) and retweet count (regression).
- Analyzed the results using accuracy, F1 score, and AUC-ROC curves to obtain an inference accuracy of 90% for each.
- Skills utilized: · Python · NLP · Machine Learning · Scikit-Learn · Pandas

Image Colorization Nov 2021 - Jan 2022

- Built four image colorization models using ResNet, U-Net, and Generative Adversarial Networks.
- Implemented a data loader with appropriate transforms, and an inference script to test on grayscale images.
- Skills utilized: · Python · PyTorch · Deep Learning · OpenCV [Code](#)

Visual Speech Recognition, Bachelor's Project Jan 2020 - July 2020

- Project involved creating a dataset from pre-existing videos and building several models such as CNNs, LSTMs, HMMs, and GANs.
- Focused on improving viseme recognition by utilizing generative adversarial networks as a tool for data augmentation.
- Utilizing GANs for augmentation led to an increase in accuracy by 3.7% over the baseline accuracy.
- Skills utilized: · Python · PyTorch · Deep Learning [Report](#)

Relevant Coursework

- Computer Vision • Linear Algebra • Bayesian Networks • Data Structures • Algorithms
- Speech Processing • Deep Learning • Machine Learning • Data Science • NLP

Examinations

Graduate Record Examinations (GRE) Jan 2019
Total: 327, Quantitative: 166, Verbal: 161, Analytical Writing: 4

Test of English as a Foreign Language (TOEFL) Aug 2019
Total: 113, Reading: 30, Listening: 29, Speaking: 27, Writing: 27

Service

External Reviewer

AAAI (2026, 2027), NeurIPS (2026)