

Education

Northwestern University

Master of Science in Computer Science, **GPA: 4.0/4.0**

Evanston, Illinois

Sep 2019 – Mar 2021

Coursework: Machine Learning, Statistics, Deep Learning Foundations, Advanced Deep Learning, Data Science Seminar, Statistical Language Modeling, Algorithms, Social Network Analytics

Labs/Groups: REALM Lab, MAGICS Lab, AI Journal Club

K.J Somaiya College of Engineering

Bachelor of Technology in Computer Engineering, **GPA: 8.99/10**

Mumbai, India

Aug 2015 – May 2019

Coursework: Machine Learning (Topper), Neural Nets, Image Analysis (Topper), AI, Data Structures, Algorithms, Operating System (Topper)

Work Experience

Alchera Labs

Applied Scientist

San Diego, California

Jul 2021 – Oct 2022

- Developed an early detection system for wildfires which can detect wildfire smoke with 91.6% accuracy. The system is actively being used in the USA to monitor near real-time data from hundreds of cameras daily.
- Researched the emergence and importance of class-selective neurons during the early epochs of training and demonstrated through a set of experiments that class selectivity is essential for successful training.

CIERA

Researcher | Prof. Vicky Kalogerá's Group

Evanston, Illinois

Jun 2020 – Jun 2021

Earthquake Detective | Prof. Suzan Van Der Lee

- Compiled and processed the first ever comprehensive ML benchmark dataset of potentially triggered earthquakes and tremors with 130k+ samples.
- Developed a ML model which uses Wavelet Scattering and Image Convolutions to detect low amplitude earthquake and tremor signals with 90.4% accuracy.
- Developed a retirement algorithm to effectively retire labeled seismic samples on Earthquake Detective - a crowdsourcing platform.

Northwestern University

Graduate Research Assistant | Prof. Prem Seetharaman

Evanston, Illinois

Jan 2020 – Jun 2020

- Developed Otoworld, an interactive environment for training Reinforcement Learning agents for Computer Audition.
- Agents trained in this environment implicitly learn to separate the sources by learning to maximize the reward of "turning-off" sources.
- Developed a RL agent with a Monaural Separation Model, Spatial Feature Extractor and a Q-Network to navigate this environment.

K.J Somaiya College of Engineering

Research Intern | Prof. Grishma Sharma

Mumbai, India

Jan 2018 – Apr 2018

- Researched k-shot learning methodologies and developed a facial recognition system which can be trained on limited data. (k=number of training samples per class).
- The system gives 100% accuracy for k=3 and subjects less than 20. For 20-30 subjects and k=3, accuracy ranges from 80 to 90%.

Accelo Innovation

Machine Learning Intern

Mumbai, India

Aug 2017 – Oct 2017

- Implemented depth mapping module using Stereo Vision and achieved a 98% accuracy (2 cm error) for objects up to 5m away. Objects 20m away were estimated with 95% accuracy.
- Implemented object detection module with a combination of Haar Cascades, Histogram of Gradients and a CNN model.
- Implemented lane detection module using Inverse Perspective Mapping.

Skills

Languages/Web: Python, Java, R, C, C++, Flask, HTML, CSS, PHP, Javascript, AngularJS, Node.js, React

Analytics/Tools: AWS, Git, Docker, Spark, Tableau, Trifacta, Matplotlib, D3.js, Google Earth Engine, ArcGIS

Databases: PostgreSQL, MySQL, MongoDB

Libraries: Pytorch, Tensorflow, OpenCV, Gym, Numpy, Pandas, SkLearn, NLTK, Keras

Certifications: Deep Learning Specialization (DeepLearning.AI), Machine Learning (Stanford, Coursera)

Publications

Conference Papers

1. **O. Ranadive**, S. van der Lee, V. Tang, and K. Chao, "Applying machine learning to crowd-sourced data from earthquake detective," in *AI for Earth Sciences Workshop, Thirty-fourth Conference on Neural Information Processing Systems (NeurIPS'20)*, Dec. 2020.
2. **O. Ranadive**, G. Gasser, D. Terpay, and P. Seetharaman, "Otoworld: Towards learning to separate by learning to move," in *Self Supervision in Audio and Speech Workshop, 37th International Conference on Machine Learning, Vienna, Austria (ICML'20)*, Jul. 2020.
3. K. Joisher, S. Khan, and **O. Ranadive**, "Simulation environment for development and testing of autonomous learning agents," in *2nd International Conference on Advances in Science & Technology (ICAST'19, Elsevier SSRN)*, Apr. 2019.

Journal Articles

1. **O. Ranadive** and D. Thakkar, "K-shot learning for face recognition," *International Journal of Computer Applications* 181 (18), pp. 43–48, Sep. 2018.

Abstracts

1. M. P. Flanagan, V. Tang, **O. Ranadive**, A. M. Thomas, and S. van der Lee, "Earthquake detective: Citizen scientists use eyes and ears to classify small seismic events," in *AGU Fall Meeting Abstracts*, Dec. 2021.

Projects

Reinforcement Learning for High-Frequency Trading

- Developed an environment to process HFT data and maintain a limit-order book in real-time.
- Developed a DDQN agent which leverages the level-2 data to take intelligent trading decisions.

LinkedIn Network Analytics

- Analyzed how LinkedIn network has changed in the post-COVID era and identified key users using centrality measures and sentiment analysis.
- Analyzed emergence and changes in communities using k-core decomposition and cluster decomposition algorithms.
- Used SIENA and STERGM models to fit the network and validate hypotheses.

Analyzing spread of COVID-19 using Graph Neural Networks

- Developed an end-to-end pipeline to process COVID-19 data into graph structures and analyze it.
- Predicted future spread in US states using Graph Convolution Network and Message Passing Network based on census data, time series info, travel data and distances between US states.

Domain Adaptation using CycleGAN

- Developed a CycleGAN architecture to map simulated images to real-world images to reduce the domain gap between real-world data and virtual environment data.
- Developed a multi-iterative CycleGAN architecture to enhance the GAN output.

Citizens Police Data Project

- Analyzed crime trends, officers, and incidents using SQL, Tableau and D3.js.
- Created a co-accusal network of officers and used graph analytics to identify key officers.
- Applied NLP on reports to find important keywords and assign severity scores.

Teaching

- Invited Lecturer - Machine Learning, ROSES'21, American Geophysical Union 2021
- Advanced Deep Learning, Graduate Student Instructor, Northwestern University 2021
- Statistical Machine Learning, Graduate Student Instructor, Northwestern University 2021
- Machine Learning Workshop, CSI, K.J Somaiya College of Engineering 2016
- Cryptography Workshop, CSI, K.J Somaiya College of Engineering 2016

Talks

- Using machine learning to detect wildfires, NICO Oct 2021
- MuZero: Learning to plan in unknown environments, AI Journal Club Feb 2021
- Earthquake Detection using crowd-sourced data, Data Skeptic Podcast Dec 2020
- AI for Earth Sciences Workshop, NeurIPS 2020 Dec 2020
- Agent57: Surpassing human performance on Atari Games, AI Journal Club Oct 2020
- Self-Supervision in Audio and Speech Workshop, ICML 2020 Jul 2020
- Imagination and Curiosity in Reinforcement Learning, AI Journal Club May 2020
- Multi-Agent Reinforcement Learning, AI Journal Club Feb 2020

Awards

- Undergraduate Final Year, Rank 2 2019
- Winner of IEEE Technical Paper Presentation for the paper "Framework for low cost driver-assistance system" 2017

Service

- Reviewer, PeerJ Computer Science Journal
- Council Member of Computer Society of India 2016-2017