Omkar Ranadive

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Omkar-Ranadive · omkar-ranadive

Education

Northwestern University — Evanston, Illinois
Master of Science in Computer Science, **GPA: 4.0/4.0** — *Sep 2019 – Present*
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 — Mumbai, India
Bachelor of Technology in Computer Engineering, **GPA: 8.99/10** — *Aug 2015 – May 2019*
Coursework: Machine Learning (Topper), Neural Nets, Image Analysis (Topper), AI, Data Structures, Algorithms, Operating System (Topper)

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

Work Experience

CIERA — Evanston, Illinois
Researcher | Prof. Vicky Kalogera's Group — *Jun 2020 – Present*

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.
- Developing a ML based retirement algorithm to effectively retire labeled seismic samples on Earthquake Detective - a crowdsourcing platform.

Northwestern University — Evanston, Illinois
Graduate Research Assistant | Prof. Prem Seetharaman — *Jan 2020 – Jun 2020*

- Developed Otoworld, an interactive environment for training Reinforcement Learning agents for Computer Audition.
- Agents are rewarded for "turning-off" sources which are spawned in the environment.
- Agents trained in this environment implicitly learn to separate the sources by learning to maximize the reward.
- 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 — Mumbai, India
Research Intern | Prof. Grishma Sharma — *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 — Mumbai, India
Machine Learning Intern — *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, C, C++, HTML, CSS, PHP, Javascript, AngularJS, Node.js
Analytics/Tools: PostgreSQL, MySQL, AWS, Git, Docker, Spark, Tableau, Trifacta, Matplotlib, D3.js
Libraries: Pytorch, Tensorflow, OpenCV, OpenAI-Gym, Numpy, Pandas, Scikit-Learn, NLTK, Keras

Publications

1. **O. Ranadive**, S. van der Lee, T. Vivian, and C. Kevin, "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.
4. **O. Ranadive** and D. Thakkar, "K-shot learning for face recognition," *International Journal of Computer Applications 181 (18)*, pp. 43–48, Sep. 2018.

Projects

Analyzing spread of COVID-19 using Graph Neural Networks: Developed an end-to-end pipeline to analyze COVID-19 data. Users can visualize the data, form a graph structure and predict spread using Graph Convolution Network and Message Passing Network.

Domain Adaptation using CycleGAN: Developed a CycleGAN architecture for generating real-world images from simulated images to reduce the domain gap between real-world data and simulated data. This leads to more effective training of AI agents in the simulation environment. Additionally, implemented a Multi-Iterative CycleGAN architecture which enhances the output produced and leads to better understanding of behavior of the generator.

Citizens Police Data Project: Analyzed the crime trends after the CPDB dataset went public vs before it was public. SQL was used to analyze officer trends, Tableau and D3.js were used to produce heat maps and visualize results, graph analytics was used to identify offending officers, and ML was used to process summaries of reports, generate severity score and find important keywords in documents.

Talks

- Agent57: Surpassing human performance on Atari Games, AI Journal Club *2020*
- Self-Supervision in Audio and Speech Workshop, ICML 2020 *2020*
- Imagination and Curiosity in Reinforcement Learning, AI Journal Club *2020*
- Multi-Agent Reinforcement Learning, AI Journal Club *2020*

Teaching

- Machine Learning Workshop, CSI, K.J Somaiya College of Engineering *2016*
- Cryptography Workshop, CSI, K.J Somaiya College of Engineering *2016*

Awards & Activities

- Undergraduate Final Year, **Rank 2** *2019*
- Winner of **IEEE** Technical Paper Presentation for the paper "Framework for low cost driver-assistance system". *2017*
- Council Member of **Computer Society of India.** *2016-2017*