Ritik Raina

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EDUCATION

UC SAN DIEGO

BS in Cognitive Science: Machine Learning and Neural Computation
June 2022 | San Diego, CA

LINKS

Github:// **rainarit**
LinkedIn:// **ritikraina**
Portfolio:// **ritik.xyz**

COURSEWORK

GRADUATE

Web Mining + Recommender Systems
Neural Networks for Pattern Recognition

UNDERGRADUATE

Reinforcement Learning
Artificial Intelligence Algorithms
Machine Learning
Computer Vision
Modeling and Data Analysis
Advanced Data Structures
Computer Organization
Object-Oriented Programming
Unix Tools and Scripting

SKILLS

Languages

Python • Java • C++ • Swift
MATLAB • LaTeX • SQL
JavaScript • Assembly • Bash

Frameworks/Tools

CUDA • Tensorflow • PyTorch
MXNet • Scikit-Learn • SciPy
OpenCV • OpenGL • Pandas
XGBoost • Vim • Git • MongoDB

EXPERIENCE

IBM | Research - Machine Learning

July 2020 - Present | San Diego, CA

- Developing machine learning methods to generate novel findings, that implicate the human microbiome in health and disease.
- Microbiome analysis using **QIIME2**, **Qiita**, and **GNPS** as well as study metadata normalization and transformation in Python.
- Automated documentation and built a pipeline for continuous integration of **scikit-bio** package with **Sphinx** and **Travis-CI**.
- Amplified the MGnify CWL pipeline to reproduce the characterization of 200k genomic sequences alongside their functional annotations.
- Researching and reproducing methods of disease prediction representation based on microbiome data.

STAR Capital | Research Intern

July 2019 – September 2019 | Jakarta, Indonesia

- Researched and developed a deep-learning-based system for long-term face tracking from propitiatory databases.
- Applied a Cascade-CNN model with the utilization of a VGG network for face detection/verification.
- Deployed further improvements on the model by operating spatial features from the Haar classifiers via OpenCV.

RESEARCH

UCSD Mattar Lab | Undergraduate Researcher

June 2020 – Present | San Diego, CA

- Worked with **Prof. Marcelo Mattar** in investigating deep reinforcement learning algorithms such as Experience Replay by enhancing their prediction-error based priority calculations.
- Currently implementing DeepMind's **Prioritized Experience Replay (Schaul et al.)** using **PyTorch** and **OpenAI** Gym to reproduce the results for 20+ Atari games as well as solve their environments.

PROJECTS

Face Generation using StyleGAN

June 2020

- Implemented features to classify images based on certain facial attributes.
- Used **NVIDIA StyleGAN** architecture and code focused on a novel approach to generate realistic images.
- Further implemented a reversal model using **Tensorflow** and **NumPy** that freezes its VGGFace weights so the only update on each iteration of gradient descent is the input latent vector.

Autoencoders for Image Denoising

June 2020

- Built two types of autoencoders via **PyTorch** by using feed-forward neural networks.
- Trained denoising encoders which mapped noisy images into actual high-quality structures.
- Used **SciPy** to stack autoencoders which would allow compressed input images to decompress, hence producing life-like thumbnails.