

NEELAY SHAH

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Website ◊ GitHub ◊ LinkedIn ◊ Google Scholar

EDUCATION

Birla Institute of Technology and Science Pilani, Goa, India 2018 - 2022 (expected)
Bachelor of Engineering (B.E.), Electronics and Instrumentation
Grade: 8.06/10

EXPERIENCE

Centre of Intelligent Robotics, IIIT Allahabad June 2020 - July 2020
Research intern (remote) | Mentor: Dr. GC Nandi

- Used model compression techniques to develop compact multi-modal emotion recognition models for human-robot interaction using deep learning
- Implemented generative grasping convolutional neural networks (GGCNN) for robotic grasping
- Tech used: Python, PyTorch, OpenCV

Aurum Smart Tech May 2020 - June 2020
Software development intern (remote)

- Worked on developing an image processing pipeline for QR code scanning
- Tech used: Python, ZBar

PUBLICATIONS/PREPRINTS

KD-Lib: A PyTorch library for Knowledge Distillation, Pruning and Quantization
Het Shah, Avishree Khare, Neelay Shah, Khizir Siddiqui
arXiv preprint | [Paper] [Code]

OPEN-SOURCE SOFTWARE

KD-Lib
[Code] [Documentation]
Co-creator

- An open-source PyTorch library for making model compression research in deep learning more accessible
- Contains implementations of algorithms from 3 families of model compression research - Knowledge Distillation, Pruning, and Quantization
- Simple and intuitive API to facilitate the use of compression techniques for custom deep learning models with few lines of code

EzFlow
[Code] [Documentation]
Co-creator

- A modular PyTorch library for optical flow estimation using neural networks
- Contains implementations of prominent deep learning algorithms for optical flow estimation and a configurable training pipeline
- Allows for easy development of custom models using components of different architectures.

VFormer
[Code] [Documentation]
Co-creator

- A modular PyTorch library for vision transformer (ViT) models.

- Contains implementations of prominent ViT architectures broken down into modular components.

TECHNICAL SKILLS

| | |
|------------------------------|---|
| Programming Languages | Python, C++, Java, MATLAB |
| Frameworks/Libraries | PyTorch, Keras, PyGeNN, scikit-learn, JAX, NumPy, Pandas, Matplotlib, OpenCV, Scipy |
| Operating Systems | Linux, Windows |
| Tools | Git/GitHub, GitHub Actions, Travis CI, AWS EC2, L ^A T _E X, Vim, Slurm, Pytest |

RESEARCH PROJECTS

Machine Learning for Satellite Navigation

Mentor: Mr. Abhijit Dey | Digital Communication Lab, BITS Pilani Goa

- Developed a deep learning pipeline to forecast irregularities in the ionosphere which cause fluctuations in satellite navigation signals
- Benchmarked machine learning models for classifying multi-path interference in satellite signals
- Tech used: Python, Keras, Pandas

Ultrasound Image Reconstruction using Deep Learning

Mentor: Dr. Manish Bhatt | BITS Pilani Goa

- Worked on developing a hybrid deep learning model for photoacoustic tomographic image reconstruction.
- Tech used: Python, PyTorch, Matlab

RELEVANT COURSEWORK

| | |
|-------------------|---|
| University | Calculus, Linear Algebra, Probability and Statistics, Discrete Mathematics, Digital Design, Introduction to Cognitive Neuroscience, Signals and Systems, Control Systems, Data Structures and Algorithms, Object-oriented Programming |
| Online | Convolutional Neural Networks for Visual Recognition (Stanford CS231n), Machine Learning (Stanford CS229), Introduction to Reinforcement Learning (UCL) |

PERSONAL PROJECTS

Transfer Learning Aided One-shot Classification | [\[Code\]](#)

- Transfer learning to improve the performance of a Siamese neural network for one-shot recognition on the MNIST dataset

Spiking Neural Networks for Speech Recognition | [\[Code\]](#)

- Biologically plausible algorithms of speech recognition using optimized neuronal network simulation software

Unsupervised Anomaly Detection | [\[Code\]](#)

- Autoencoders to identify anomalies in chest X-rays

Deep Learning Optimizers | [\[Code\]](#)

- Toy implementations of popular deep learning optimization techniques from scratch

Machine Learning for Network Forensics | [\[Code\]](#)

- Machine learning based network forensic mechanism for botnet activities in the Internet of Things (IoT)

GANs for Robotic Grasp Detection | [\[Code\]](#)

- Exploratory use of image-to-image translation generative adversarial networks (GANs) to generate grasp orientations for robotic grasping

Signboard Detection | [Code]

- Detection of signboards containing text in vernacular languages using deep learning

MENTORSHIP

Mentor - SAiDL Season of Code (SSoC)

Student-run course open-source development program | [Website]

- Leading the development of an open-source machine learning library and mentoring co-developers

Instructor - Introduction to Deep Learning

Student-run course | Centre for Technical Education, BITS Pilani Goa

- Taught and created reference material for an introductory deep learning course intended for college freshmen

OTHER ACTIVITIES

Member

Society for Artificial Intelligence and Deep Learning

- Involved in reading and discussion sessions on artificial intelligence research

Member

University cricket team

- Participated in university level cricket tournaments

MISCELLANEOUS

Languages spoken English, Hindi, Gujarati, Marathi, German (A1 level)

Interests/Hobbies Sports (esp. Cricket and Football), International Relations, Geopolitics