

Nirbhay Sharma

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Education

B.Tech, CSE | Indian Institute of Technology (IIT) Jodhpur

Aug'19-May'23

CGPA: **8.97**/10

Technical Skills

Languages: Python, C/C++, HTML/CSS, Javascript, Haskell, Prolog**Tools and Frameworks:** Pytorch, Flask, Django, Regex, Heroku, Git, Github, Firebase, MongoDB, Mysql**Familiar with:** Tensorflow, Java, React, Nodejs, ejs, Google Colab, OpenCV

Experience

Split Neural Networks | Pytorch, Python, Jetson Nano, PySyft**Intern** (ML Engineer) | **ExaWizards** India

Jun'22-July'22

- Splitted **Mask-RCNN**, **FCN_Resnet50**, **YOLOv5** for **Instance segmentation**, **segmentation**, **face detection** tasks
- Utilized **PySyft** and **Jetson Nano** for transferring features from one device to another
- Implemented **encoder-decoder** architecture for **tensor compression**
- Reduced **inference time** on Jetson nano device while preserving **data privacy**

Projects

Noise Engineered Federated Distillation for Heterogeneous Settings | Pytorch, FL, Python**Research Project** | Supervisor: **Dr. Deepak Mishra** | IIT Jodhpur

Aug'22-May'23

- **Proposed** a **novel** Federated Learning Framework to handle **model heterogeneity** among clients
- Utilized the concept of **Data-free KD** for **knowledge transfer** from Client models to Server model
- Solved the issue of requirement of **Generator or proxy dataset** at server end for KD
- Utilized **Gaussian Noise** samples for Distillation
- Compared and **analyzed** our algorithm with state-of-the-art algorithms for **Model heterogeneity**
- **Outperformed** the **relevant baselines** in terms of **test accuracy** by a considerable margin

Light Weight CNN Model for Chest Radiographs Classification | Pytorch, Python, Torchvision, Numpy**Research Project** | Supervisor: **Dr. Angshuman Paul** | IIT Jodhpur

Jun'21-Mar'22

- Designed a **Lightweight CNN model** for the abnormal detection of **Chest Radiographs**
- Combined the ideas from **Squeezenet** and **Mobilenet** to prepare a Light weight model
- Our Model Outperforms various light weight CNN architectures like **Squeezenet**, **Shufflenet**, **Mobilenet** on NIH dataset both on binary and multiclass classification
- Our **research paper** recently got revised in **Medical Physics Journal**

Regularizing Federated Learning (FL) via Adversarial Model Perturbations (AMP) | [Github](#) | Pytorch, FL, Python**Course Project** | Supervisor: **Dr. Richa Singh** | IIT Jodhpur

- Compared and analyzed the effect of **Adversarial Model Perturbations (AMP)** on 4 state-of-the-art Federated Learning algorithms
- Implemented **FedAvg**, **FedProx**, **FedNTD**, **SCAFFOLD** from **scratch**
- Integrated the AMP module with aforementioned FL algorithms at client side
- Observed a boost of **2-3%** accuracy in each of the algorithm

CNN Algorithms Comparison | [Github](#) | Pytorch, Numpy, Matplotlib, PIL, Python**Course Project** | Supervisor: **Dr. Mayank Vatsa** | IIT Jodhpur

- Compared 7 deep **CNN** architectures on **Retinal Eye disease dataset**

- Implemented **Squeezenet, Mobilenet, Inceptionnet, Shufflenet, Googlenet, Resnet, Efficientnet** from **scratch**
- Performed a comparison study among the state-of-the-art deep CNN architectures