

**Nirbhay Sharma** | +91 9369630713 | [sharma.59@iitj.ac.in](mailto:sharma.59@iitj.ac.in) | [Github](#) | [Portfolio](#) | [LinkedIn](#)

## Education

**B.Tech, CSE** | Indian Institute of Technology (IIT) Jodhpur | CGPA: **8.97/10**

08/2019-05/2023

## Technical Skills

**Programming Languages:** Python, C/C++ | **Skills:** Machine Learning, Deep Learning, Computer Vision

**Tools and Frameworks:** Pytorch, Django, Flask, Docker, AWS Lambda, Regex, Git, Github, Firebase, MySQL

## Publications

- **An Extremely Lightweight CNN Model For the Diagnosis of Chest Radiographs in Resource-constrained Environments** | *International Journal of Medical Physics* 2023 | [Paper](#)
- **Aggregation-Assisted Proxyless Distillation: A Novel Approach for Handling System Heterogeneity in Federated Learning** | *International Joint Conference on Neural Networks (IJCNN)* 2024

## Research and Work Experience

**Faaya Astu India** | **Full Time** (ML Engineer) | Pytorch, Diffusion, ControlNet, LoRA

06/2023-Present

- Worked on **SOTA Stable Diffusion, ControlNet** and **LoRA** models for text to print, and content generation
- Trained **Stable Diffusion ControlNet** architecture on **Lineart** and **Colorbox** control on **VastAI** GPU instance to provide more flexibility and control on print generation
- Trained **Low Rank Adaptation (LoRA)** models using **Kohya\_SS** for controlled background and face generation
- Containerized **Stable Diffusion WebUI** and **ControlNet** using **Docker** to deploy them as **Serverless Endpoints** on **RunPod** and exposed endpoint APIs to **AWS Lambda** to create **APIs for APP** using **AWS API gateway**

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

06/2022-07/2022

- Splitted **Mask-RCNN, FCN\_Resnet50, YOLOv5** for **Instance segmentation, segmentation, face detection** tasks
- Implemented **Autoencoder** model for efficient **image compression to latent space** and setup **Pysyft** to communicate latent features from **Jetson Nano** to GPU server, **preserving data privacy** at Jetson Nano

**Noise Engineered Federated Distillation for Heterogeneous Settings** | Pytorch, Federated Learning, Data-Free KD

**Research Project** | Supervisor: **Dr. Deepak Mishra** | IIT Jodhpur

08/2022-05/2023

- **Proposed** a **novel** Federated Learning (FL) Framework to handle **model and data heterogeneity**
- Implemented **data-free KD** using **Gaussian Noise** at the **Server**, eliminating need of **proxy dataset** or **GAN's**
- Our algorithm achieved **3x** better performance compared to SOTA FL algorithms like **FedDF, FedMD, Kt-pfl**

**Light Weight CNN Model for Chest Radiographs Classification** | Pytorch, Light Weight CNN Models

**Research Project** | Supervisor: **Dr. Angshuman Paul** | IIT Jodhpur | [Paper](#)

06/2021-03/2022

- Designed a **Lightweight CNN model (ExLNet)** for the abnormal detection of **Chest Radiographs**
- Fused **Squeeze and Excitation** blocks with **Depth-wise convolution** to create **DCISE** layer as a component of **ExLNet**, which outperforms SOTA models like **Mobilenet, Shufflenet** on medical datasets like **NIH, VinBig**

## Projects

**Regularizing Federated Learning (FL) via Adversarial Model Perturbations (AMP)** | [Github](#)

- Analyzed the effect of integrating **AMP** on SOTA FL algorithms like **FedAvg, FedProx, FedNTD, SCAFFOLD**. Observed a boost of **2-3%** accuracy on CIFAR10/100 dataset with AMP integrated FL algorithms

**Image Captioning using Detection Transformer (DeTR)** | [Github](#)

- Implemented modified **DeTR** from **scratch** in **Pytorch** for **image captioning** task. Trained **DeTR** on **Flickr30k** dataset for **500** epochs and achieved a **BLEU** score of **57.36** on **Flickr8k** dataset

**Transformers-Implementation** | [Github](#)

- Implemented **11** SOTA research papers on **vision transformers** variants like **Swin Transformer, Pyramid ViT, Convolution ViT** etc. for **Image Classification** from scratch in **Pytorch**