Sachin Chhabra

+1-480-559-5983 | sachin.chhabra@asu.edu | s-chh | s-chh | Scholar

Education

Arizona State University — **May 2024**
Degree: Doctor of Philosophy (Ph.D.) — Tempe, AZ
Major: Computer Science — GPA: 4.0/4.0

Arizona State University — **May 2019**
Degree: Master of Science (M.Sc.) — Tempe, AZ
Major: Computer Science — GPA: 3.9/4.0

VIT University — **Aug 2013**
Degree: Bachelor of Technology (B.Tech) — Vellore, India
Major: Computer Science

Publications

- Chhabra,S., Hemanth Venkateswara, and Baoxin Li. **PatchRot: Self-Supervised Training of Vision Transformers by Rotation Prediction.** *British Machine Vision Conference (BMVC), 2024* [GitHub]
- Chhabra,S., Hemanth Venkateswara, Baoxin Li. **Label Smoothing++: Enhanced Label Regularization for Training Neural Networks.** *British Machine Vision Conference (BMVC), 2024.* [GitHub]
- Chhabra,S., Yaoxin Zhuo, Riti Paul, Javad Sohankar, Ji Luo, Shan Li, Wendy Lee, Yi Su, Teresa Wu, Baoxin Li. **Translation of Partially Paired Images with Generative Adversarial Networks** *IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI), 2024.* [PDF]
- Chhabra,S., Hemanth Venkateswara, Baoxin Li. **Generative Alignment of Posterior Probabilities for Source-free Domain Adaptation** *Winter Conference on Applications of Computer Vision (WACV), 2023.* [Web] [PDF]
- Chhabra,S., Hemanth Venkateswara, Baoxin Li. **PatchSwap: A Regularization Technique for Vision Transformers.** *British Machine Vision Conference (BMVC), 2022.* [Web] [PDF] [GitHub]
- JE Caviedes, BK Patel, R Gutzwiller, B Li, R Bhat, Chhabra,S.. **A Cognitive Perspective on Subjective and Objective Diagnostic Image Quality Models** *International Conference on Image Processing (ICIP), 2022.* [PDF]
- Chhabra,S., Prabal Bijoy Dutta, Hemanth Venkateswara, Baoxin Li. **Glocal Alignment for Unsupervised Domain Adaptation.** *ACM Multimedia Workshop on Multimedia Understanding with Less Labeling (MULL), 2021.* [PDF] [GitHub]
- Chhabra,S., Prabal Bijoy Dutta, Hemanth Venkateswara, Baoxin Li. **Iterative Image Translation for Unsupervised Domain Adaptation.** *ACM Multimedia Workshop on Multimedia Understanding with Less Labeling (MULL), 2021.* [PDF]
- Chhabra,S., PrasanthSai Gouripeddi, Hemanth Venkateswara, Baoxin Li. **LLS: Regulating Neural Network Training via Learnable Label Smoothing** *Under review at International Conference on Learning Representations (ICLR), 2025.*
- Chhabra,S.. **Making the Best of What We Have: Novel Strategies for Training Neural Networks under Restricted Labeling Information** *Ph.D. Thesis, 2024.* [PDF]

Ongoing Work

- Diffused-based conditional medical image translation.
- Building a new dataset for domain adaptation problem.
- Finetuning LLM for specialized use cases.

Professional Services

- Regularly reviewed research papers for CVPR, ICLR, NeurIPS, ICCV, ECCV, ICML, BMVC, WACV, ACM TIST, and Pattern Recognition.
- Outstanding Reviewer for BMVC 2024.

Teaching Experience

- Taught several lectures on Introduction to Machine Learning and Deep Learning for CEE 598/494 (Graduate and Undergraduate level).
- Guest Lecture on Generative Adversarial Networks (GAN) for CEE 598/494.
- Teaching assistant experience for Intro to Deep Learning in Computer Vision (CSE 591), "Foundations of Machine Learning" (CSE475), Introduction to Machine Learning and Deep Learning (CEE 598/494), Object-Oriented Programming and Data Structures (CSE 205).

Industry Experience

Wayfair **July 2024 — Present**
Machine Learning Scientist *Boston, MA*

- Applying machine/deep learning techniques for data analysis and sales forecasting.
- Building multi-task neural networks for various types of inputs.
- Tech Stack: PyTorch, Scikit-learn, Python, SQL, GCP.

Wayfair **June 2023 — Aug 2023**
Machine Learning Scientist Intern *Boston, MA*

- Automated product color extraction from images using object detection and segmentation based on input query text.
- Created a pipeline with state-of-the-art models: Segment-Anything-Model(SAM), GroundingDINO and modified them to adapt for our use case.
- Tech Stack: PyTorch, Huggingface, Scikit-learn.

Wayfair **May 2022 — Aug 2022**
Machine Learning Scientist Intern *Boston, MA*

- Designed and implemented a Graph Neural Network (GNN) framework to build an item-to-item-based recommendation system.
- Developed novel loss functions to optimize the training of GNNs.
- Tech Stack: PyTorch, Deep Graph Library(DGL), Scikit-learn, Python, SQL, GCP.

Systems Imagination **May 2020 — Aug 2020**
Machine Learning Research Intern *Tempe, Arizona (Remote)*

- Developed a hybrid neural network framework that processes time series and tabular data to predict COVID-19 case counts and risk for the US counties.
- Tech Stack: PyTorch, Scikit-learn, Python.

Accenture **Dec 2013 — Jun 2017**

Senior Software Engineer *Bangalore, India*

- Worked on migration scripts, stored procedures for databases, and wrote SQL queries for ETL transformation logic.
- Tech Stack: SQL.

Projects

Large Language Model (LLM) from Scratch in PyTorch [GitHub]

- Developed GPT3 and LLaMA-2 based Large Language Models (LLM) from scratch in PyTorch with functionalities like Byte-Pair Tokenizer, Rotational Positional Embedding (RoPe), SwishGLU, RMSNorm, and Mixture of Experts (MOE).

Vision Transformer from Scratch in PyTorch | [100+ ★] [GitHub]

- Built Vision Transformer (ViT) from scratch in PyTorch, including operations like self-attention.

Various Generative Adversarial Networks (GAN) [GitHub]

- Implemented Vanilla-GAN, Deep Convolution GAN (DCGAN), Least Squared GAN (LSGAN), Conditional GAN (cGAN), CycleGAN, Wasserstein GAN (WGAN), Improved Wasserstein GAN (WGAN-GP), and StarGAN for generating/translating images.

Facial Expression Recognition - *Master Thesis* **Apr 2019**

- Built a hybrid convolutional neural network (CNN) by fusing features from multiple domains to achieve better classification.
- Created a real-time system that detects a face and classifies it into one of the expressions using the trained model.

Duplicate Photos and Video finder [GitHub]

- Developed a Python program to solve my problem of getting duplicate photos from multiple shared sources.
- Program identifies and deletes duplicate images and videos within a folder and its subdirectories with high speed and accuracy.

Technical Skills

Skills	Computer Vision, Deep Learning, Machine Learning, Data Science, Google Cloud Services (GCP)
Languages	Python, SQL, Java
ML Packages	PyTorch, OpenCV, Scikit-learn, NumPy, MATLAB, Keras, TensorFlow
Deep Learning	Transfer Learning, Generative Adversarial Network (GAN), Transformers, Graph Neural Network (GNN)