Shivang Chopra

Ph.D. in Computer Science at Georgia Institute of Technology

Email: shivangchopra11@gatech.edu
Website: shivangchopra11.github.io
LinkedIn: shivangchopra11

EDUCATION

Georgia Institute of Technology — Jan 2025 - Present
Ph.D. in Computer Science

Advisor: Prof. Zsolt Kira ↗

Publications: CVPR 2025 (Under Review) [2], ICLR 2025 (Under Review) [3]

Georgia Institute of Technology — Aug 2022 - Dec 2024
Master of Science in Computer Science, Specialization: Machine Learning — **CGPA:** 3.90/4.0

Advisor: Prof. Zsolt Kira ↗

Thesis: CRAFT: Curriculum Rank Adversarial Fine-Tuning for Robust Vision Language Models

* Developed a unified LoRA-based framework to enhance the adversarial robustness of Vision-Language models.
* Integrated low-rank adversarial weight perturbations to enhance the fine-tuned model's domain generalization.

Publications: WACV 2025 [4], CoRL 2023 [6], ICASSP(W) 2023 [11], CVPR 2025 (Under Review) [1]

Delhi Technological University — Aug 2016 - May 2020
Bachelor of Technology in Computer Engineering — **CGPA:** 8.62/10.0

Advisor: Prof. Anil Singh Parihar ↗

Thesis: Transformer-based approach for sketch recognition using vector images

Publications: AAAI 2020 [7], IEEE CDS [8], ICML(W) [5], ECAI [9], ECIR [10]

RESEARCH INTERNSHIPS

Sony R&D Labs — Zurich, Switzerland
Computer Vision Research Intern — Sep 2023 - Apr 2024

Project: Real-time ball tracking and spin estimation using Event-based Vision Sensors (EVS) for a Table Tennis robot.

* Developed custom algorithms to reduce the sim2real gap for object tracking and detection for event-vision sensor data
* Deployed the trained models on edge for real-time inference using techniques like model quantization and pruning.

Amazon Science — Washington, USA
Applied Scientist Intern — May 2023 - Aug 2023

Project: Product recommendation system for newly onboarded products on Amazon.com

* Developed a continual learning pipeline to efficiently incorporate new products without loosing prior knowledge.
* Integrated the training scripts with AWS data using PySpark and deployed the system for real-time inference.

Microsoft Research Lab India — Bangalore, India
Research Intern — May 2022 - Aug 2022

Project: Video Conferencing for Hybrid Workspaces. Paper published at UbiComp 2023 (IMWUT) [12]

* Worked on a Computer Vision-based system to enable informal interaction among users in hybrid workspaces.
* Improved accessibility for hybrid participants by integrating directional audio and gaze tracking modules.
* *Granted a U.S. patent for the AI prototype* [P1]

University of Texas, Dallas — Virtual
Research Intern — Mar 2022 - July 2022

Project: Unknown class data discovery using Active Learning. Paper published at Real ML workshop at ICML 2022 [5]

* Worked on an Active Learning-based approach to handle data extreme data imbalance in training data.
* Used a Submodular Information (SMI)-based Active Learning Approach for unknown class data discovery.

IBM Research Lab — Delhi, India
Research Intern — June 2020 - Aug 2020

Project: Real-time explicit content detection in videos. (Project Report)

* Developed a multi-modal system for storyline-preserving explicit content detection in OTT content.
* Developed a Javascript-based Chrome extension to facilitate the isolation of explicit content in real-time.

FULL-TIME WORK EXPERIENCE

CodeNation Innovation Labs — Bangalore, India
Software Development Engineer — Sep 2020 - Apr 2022

Project 1: Cab ride-sharing application for small cab companies (iOS App, Android App)

* Developed and deployed Android and iOS applications to facilitate ride-sharing in real-time.

Project 2: Engaging and interactive web-based learning application for students (Demo)

* Developed an NLP-based read-along tool that examined the students' audio to evaluate fluency and correctness.

Frameworks: iOS, Android, Swift, Kotlin, Java Spring, React, Django, AWS, Tensorflow, Neo4J Graph Database

PUBLICATIONS

Under Review

[1] **CRAFT: Curriculum Rank Adversarial Fine-Tuning for Robust Vision Language Models**
Shivang Chopra, Chengyue Huang, Brisa Maneechotesuwan, Zsolt Kira.
Under review at CVPR 2025

[2] **A Close Look at Robust Fine-Tuning for Visual Question Answering**
Chengyue Huang, Brisa Maneechotesuwan, **Shivang Chopra**, Zsolt Kira
Under review at CVPR 2025

[3] **Directional Gradient Projection for Robust Fine-tuning of Foundation Models**
Chengyue Huang, Junjiao Tian, Brisa Maneechotesuwan, **Shivang Chopra**, Zsolt Kira
Under review at ICLR 2025

Published

[4] **Refining Text-to-Image Generation: Towards Accurate Training-Free Glyph-Enhanced Image Generation**
Sanyam Lakhanpal, **Shivang Chopra**, Vinija Jain, Aman Chadha, Man Luo
Paper accepted at Winter Conference on Applications of Computer Vision WACV, 2025 (Paper)

[5] **Active Data Discovery: Mining Unknown Data using Submodular Information Measures**
Suraj Kothawade, **Shivang Chopra**, Saikat Ghosh, Rishabh Iyer
Published at the RealML workshop at ICML 2022. (Paper)

[6] **Learning to Discern: Imitating Heterogeneous Human Demonstrations with Preference and Representation Learning**
Sachit Kuhar, Shuo Cheng, **Shivang Chopra**, Matthew Bronars, Danfei Xu
Published at the Conference on Robot Learning, CoRL 2023 (Paper)

[7] **Hindi-English Hate Speech Detection: Author Profiling, Debiasing, and Practical Perspectives**
Shivang Chopra, Ramit Sawhney, Puneet Mathur, Rajiv Ratn Shah
Published at the AAAI Conference on Artificial Intelligence, AAAI 2020 (Paper)

[8] **Attention-Net: An Ensemble Sketch Recognition Approach using Vector Image**
Shivang Chopra*, Gaurav Jain*, Suransh Chopra*, Anil Singh Parihar
Published in IEEE Transactions on Cognitive and Developmental Systems, IEEE CDS, 2022 (Paper)

[9] **TransSketchNet: Attention-based Sketch Recognition using Transformers**
Shivang Chopra*, Gaurav Jain*, Suransh Chopra*, Anil Singh Parihar
In the proceedings of European Conference on Artificial Intelligence, ECAI 2020 (Paper)

[10] **Utilizing Temporal Psycholinguistic Cues for Suicidal Intent Estimation**
Puneet Mathur, Ramit Sawhney, **Shivang Chopra**, Maitree Leekha, Rajiv Ratn Shah
Published at the European Conference on IR Research, ECIR 2020 (Paper)

[11] **Symbiotic Artificial Intelligence: Order Picking and Ambient Sensing**
Zhe Ming Chng, Calix Tang, Darshan Krishnaswamy, **Shivang Chopra**, Jon Womack, Thad Starner
Published at the Workshop of Ambient AI at ICASSP 2023 (Paper)

[12] **HyWay: Enabling Unstructured Conversations in the Hybrid World**
Harsh Vijay, Saumay Pushp, Amish Mittal, Praveen Gupta, Meghna Gupta, Sirish Gambhira, **Shivang Chopra**, Mayank Baranwal, Arshia Arya, Ajay Manchepalli, Venkat Padmanabhan
Published in ACM Transaction on Interactive, Mobile, Wearable and Ubiquitous Technologies IMWUT (Paper)

PATENTS

[P1] Hybrid Environment for Interactions Between Virtual and Physical Users (**US 18/358,485**), 2024

SELECTED PROJECTS

Imitation Learning from Suboptimal Demonstrations. (Published at CORL 2023 [6])
Advisor: *Prof. Danfei Xu ☐ (Georgia Institute of Technology)*

○ The project aims at estimating the quality of demonstrations by using an Inverse Reinforcement Learning model.

○ Using the estimated quality to boost the performance of imitation learning algorithms like Behavioral Cloning.

Source-Free Domain Adaptation (SFDA) with Diffusion Models. (Project Report)
Advisor: *Aman Chadha ☐ (Amazon)*

○ Developed an approach to perform SFDA by using a pre-trained diffusion model to generate source-like images.

○ The system achieved SOTA results across standard benchmarks like Office31, OfficeHome, and VisDA.

AI Through Symbiosis (Published at ICASSPW 2023 [11])
Advisor: Prof. Thad Starner ⬀ *(Georgia Institute of Technology)*

- The project aims to use a Heads-Up display to optimize the picking process in an assembly line.
- Developed generalized algorithms for hand detection and object detection in egocentric videos.

Cancer-causing gene detection in fluorescence in-situ hybridization (FISH) images using FRCNN
Advisor: Dr. Robert Faryabi ⬀ *(University of Pennsylvania)*

- Implemented a UNet-based approach to segment chromosomes in the nuclei of each cell.
- Finetuned an FRCNN model to detect cancer-causing gene sequences in stained DNA sequences.

AWARDS AND ACHIEVEMENTS

Graduate Student Scholarship , Georgia Institute of Technology		2023,2024
Research Excellence Award, Delhi Technological University		2020
Student Research Travel Grant, Microsoft Research India		2020
Qualified for Onsite Regionals, ACM ICPC (International Collegiate Programming Contest)		2018

COURSEWORK

Master Of Science: Machine Learning, Vision Language Models, Deep Learning for Robotics, Game AI, Natural Language Processing, Online Communities, Video Game Design

Bachelor of Technology: Machine Learning, Artificial Intelligence, Natural Language Processing, Big Data Analytics, Operating Systems, Database Management Systems, Compiler Design, Computer Networks, Software Engineering

ACADEMIC SERVICES

Reviewer: NeurIPS 2024, ICLR 2025, AISTATS 2025, ICML 2025
Student Volunteer: AAAI 2020