

SAVYA KHOSLA

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EDUCATION

University of Illinois Urbana-Champaign

MS in Computer Science (CGPA: 4.0 / 4.0)

- Thesis advisor: Prof. Derek Hoiem
- Activities: Graduate Teaching Assistant

Urbana, IL

Aug 2022 - May 2024

Delhi Technological University

B.Tech. in Computer Engineering (CGPA: 9.40 / 10.0)

- Awards: Received Research Excellence Award and INR 50,000 for noteworthy contributions to machine learning research

New Delhi, DL

Aug 2017 - July 2021

RESEARCH EXPERIENCE

Allen Institute for AI

Research Intern

- Working towards improved multimodal video representation learning by efficiently handling videos of up to 10 minutes
- Contributed to a unified model for images, text, audio, videos, thereby performing 50+ tasks spanning across CV, NLP, GenAI

Seattle, WA

Oct 2022 - Present

National University of Singapore

Research Assistant (Guide: Prof. Kenji Kawaguchi)

- Developed robust active learning algorithm for handling heteroskedastic noise, resulting in 10% accuracy boost over baselines
- Demonstrated 15% accuracy improvement in other state-of-the-art algorithms by incorporating a simple self-supervised approach

Remote

Apr 2022 - Aug 2022

Mila - Quebec AI Institute

Research Intern (Guide: Prof. Yoshua Bengio)

- Demonstrated catastrophic failure of uncertainty-based active learning algorithms by proposing 3 heteroskedastic data distributions
- Proposed adversarial training method that gives 48% reduction in error rate on clean data while preserving adversarial robustness

Montreal, QC

Apr 2021 - Nov 2021

Delhi Technological University

Undergraduate Researcher (Guide: Prof. Anil Singh Parihar)

- Worked on improving object recognition systems in the presence of adversaries like occlusion and blurriness
- Used image-based representation of malware binaries and leveraged ensembling to develop SOTA model for malware classification

New Delhi, DL

Apr 2021 - Nov 2021

INDUSTRY EXPERIENCE

Google

Software Engineer

- Improved Google Search's web ranking infrastructure using deep learning for better multimodal document understanding
- Enhanced precision and recall in salient entity extraction from webpages by transitioning from traditional ML methods to LLMs

Bangalore, KA

Aug 2021 - Mar 2022

Google

Software Engineering Intern

- Initiated the development of MuRIL, a BERT-based multilingual language model for 17 Indian dialects
- Achieved 10.42% F1 improvement in sentiment analysis and 9.87% in named entity recognition for Indian languages

Bangalore, KA

May 2020 - Jul 2020

Cadence Design Systems

Python Developer Intern

- Streamlined complex multi-step process of fetching file revisions from 2 version control systems to a single bash command

Noida, UP

Dec 2018 - Jan 2019

TEACHING EXPERIENCE

CS 445: Computational Photography

Teaching Assistant (Instructor: Prof. Derek Hoiem)

- Responsibilities encompass conducting office hours, grading projects, and resolving students' doubts

Urbana, IL

Aug 2023 - Present

CS 225: Data Structures and Algorithms with C++

Teaching Assistant (Instructor: Prof. Carl Evans and Prof. Brad Solomon)

- Taught a lab of 150+ students in Fall 2022 and 80+ students in Spring 2023
- Additional responsibilities encompassed conducting office hours, grading projects, and mentoring students in their final projects

Urbana, IL

Aug 2022 - May 2023

SELECTED PUBLICATIONS

1. **Neural Active Learning on Heteroskedastic Distributions** [ECAI](#)
[Savya Khosla](#), Chew Kin Whye, Jordan T. Ash, Cyril Zhang, Kenji Kawaguchi, Alex Lamb
European Conference on Artificial Intelligence (ECAI), 2023
2. **Interpolated Adversarial Training: Achieving Robust Neural Networks Without Sacrificing Too Much Accuracy** [Journal](#)
Alex Lamb, Vikas Verma, Kenji Kawaguchi, Alexander Matyasko, [Savya Khosla](#), Juho Kannala, Yoshua Bengio
Neural Networks, 154:218–233, 2022
3. **S-DCNN: Stacked Deep Convolutional Neural Networks for Malware Classification** [Journal](#)
Anil Singh Parihar, Shashank Kumar, [Savya Khosla](#)
Multimedia Tools and Applications, 81:30997–31015, 2022
4. **Catastrophic Failures of Neural Active Learning on Heteroskedastic Distributions** [NeurIPS](#)
[Savya Khosla](#), Alex Lamb, Jordan Ash, Cyril Zhang, Kenji Kawaguchi
NeurIPS 2021 Workshop on Distribution Shifts: Connecting Methods and Applications, 2021
5. **AE-DCNN: Autoencoder Enhanced Deep Convolutional Neural Network For Malware Classification** [IEEE](#)
Shashank Kumar, [Savya Khosla](#), Shivangi Meena, Anil Singh Parihar
2021 International Conference on Intelligent Technologies (CONIT), 2021
6. **MuRIL: Multilingual Representations for Indian Languages** [arXiv](#)
Simran Khanuja, Diksha Bansal, Sarvesh Mehtani, [Savya Khosla](#), Atreyee Dey, Balaji Gopalan, Dilip Kumar Margam, Pooja Aggarwal, Rajiv Teja Nagipogu, Shachi Dave, Shruti Gupta, Subhash Chandra Bose Gali, Vish Subramanian, Partha Talukdar
Media Coverage: [Economic Times](#), [Indian Express](#), [Google AI Blog](#)

PROJECTS

Occluded Facial Expression Recognition

[Link](#)

- An occluded facial expression recognition framework that leverages non-occluded images as privileged information
- The technique rendered an average gain of 3.90% over the baseline for 3 standard benchmarking datasets
- Technical stack used: Learning Using Privileged Information, Convolutional Neural Networks, TensorFlow

Image Captioning

[Link](#)

- A CNN and RNN-based model for generating a textual description of an image based on the objects and actions in it
- Technical stack used: Convolutional Neural Networks, Recurrent Neural Networks, Beam Search Algorithm, Keras, Python

Text to Image

[Link](#)

- A conditional GAN for synthesizing 256x256 dimensional photo-realistic images given textual descriptions
- Technical stack used: Conditional Generative Adversarial Networks (used the StackGAN architecture), TensorFlow, Python

AgroAI

[Link](#)

- A group project to build an unbiased platform for farmers to predict the quality and price of the crops
- Presented this project in Google's Explore ML Bootcamp
- Technical stack used: React, NodeJS, Mongo, Flask (Python)

SKILLS

Languages: Python, C++, JavaScript, Bash

Frameworks: TensorFlow, Keras, PyTorch, JAX, Flax, OpenCV, GradIO

Tools: Git, Visual Studio

Others: Data Structures, Algorithms, Machine Learning, Computer Vision, NLP, Multimodal Learning, Data Handling, GCP

COURSES & CERTIFICATIONS

Graduate Courses

- CS 598: Vision by Prof. Svetlana Lazebnik
- CS 588: Autonomous Vehicle System Engineering by Prof. David Alexander Forsyth
- CS 543: Computer Vision by Prof. Svetlana Lazebnik
- CS 445: Computational Photography by Prof. Derek Hoiem
- CS 444: Deep Learning for Computer Vision by Prof. Svetlana Lazebnik
- CS 410: Text Information System by Prof. ChengXiang Zhai

Relevant Undergraduate Courses

- CO 201: Data Structures
- CO 202: Database Management System
- CO 203: Object-Oriented Programming
- CO 206: Algorithm Design and Analysis
- CO 304: Artificial Intelligence
- CO 404: Data Warehousing and Data Mining
- CO 407: Distributed Systems
- CO 414: Big Data Analytics
- CO 423: Swarm and Evolutionary Computing
- IT 420: Computer Vision

Online Courses & Certifications

- Deep Learning Specialization by Andrew Ng
 - Neural Networks and Deep Learning
 - Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
 - Structuring Machine Learning Projects
 - Convolutional Neural Networks
 - Sequence Models
- Machine Learning by Stanford University (CS229 Lectures by Andrew Ng)
- Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning by deeplearning.ai
- C++ Bootcamp by Coding Blocks
- Competitive Programming Bootcamp by Coding Blocks
- Machine Learning Master Course by Coding Blocks