

SAVYA KHOSLA

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EDUCATION

University of Illinois Urbana-Champaign

Ph.D. in Computer Science

- Advisors: Prof. Derek Hoiem and Prof. Alexander Schwing

Urbana, IL

Aug 2024 - Present

University of Illinois Urbana-Champaign

M.S. in Computer Science (CGPA: 4.0 / 4.0)

- Advisor: Prof. Derek Hoiem

Urbana, IL

Aug 2022 - May 2024

Delhi Technological University

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

- Advisor: Prof. Anil Singh Parihar

New Delhi, DL

Aug 2017 - July 2021

RESEARCH EXPERIENCE

Adobe

Research Scientist Intern

- Developed a method to simultaneously enhance LLMs with generative and representation learning capabilities
- The enhanced LLMs can perform open-ended generation, text infilling, and token-level and sentence-level representation learning

San Jose, CA

May 2024 - Aug 2024

University of Illinois Urbana-Champaign

Research Assistant (Guide: Prof. Derek Hoiem)

- Worked towards an efficient way of representing videos that can be used for various downstream tasks
- Focussing on the task of spatio-temporal localization of small entities (objects or events) in long videos

Urbana, IL

Jan 2023 - May 2024

Allen Institute for AI

Research Intern

- Worked on a memory-augmented multimodal encoder for understanding videos ranging from a few seconds to tens of minutes
- Contributed to Unified-IO 2, an instruction-following model that can parse and generate multimodal data and perform 120+ tasks

Seattle, WA

Oct 2022 - Dec 2023

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

PUBLICATIONS & PREPRINTS

(† denotes alphabetical order, * denotes equal contribution)

1. **RELOCATE: A Simple Training-Free Baseline for Visual Query Localization Using Region-Based Representations** [Link](#)
Savya Khosla, Sethuraman TV, Alex Schwing, Derek Hoiem
Computer Vision and Pattern Recognition, 2024
2. **MAGNET: Augmenting Generative Decoders with Representation Learning and Infilling Capabilities** [Link](#)
Savya Khosla, Aditi Tiwari, Kushal Kafle, Simon Jenni, Handong Zhao, John Collomosse, Jing Shi
ArXiv:2501.08648, 2024
3. **Unified-IO 2: Scaling Autoregressive Multimodal Models with Vision, Language, Audio, and Action** [Link](#)
Jiasen Lu*, Christopher Clark*, Sangho Lee*, Zichen Zhang*, Savya Khosla, Ryan Marten, Derek Hoiem, Aniruddha Kembhavi
Computer Vision and Pattern Recognition, 2024
4. **Survey on Memory-Augmented Neural Networks: Cognitive Insights to AI Applications** [Link](#)
Savya Khosla*, Zhen Zhu*, Yifan He*
ArXiv:2312.06141, 2023
5. **Understanding and Improving Neural Active Learning on Heteroskedastic Distributions** [Link](#)
Savya Khosla, Chew Kin Whye, Jordan T. Ash, Cyril Zhang, Kenji Kawaguchi, Alex Lamb
European Conference on Artificial Intelligence, 2023
6. **Interpolated Adversarial Training: Achieving Robust Neural Networks Without Sacrificing Too Much Accuracy** [Link](#)
Alex Lamb, Vikas Verma, Kenji Kawaguchi, Alexander Matyasko, Savya Khosla, Juho Kannala, Yoshua Bengio
Neural Networks, 2022
7. **S-DCNN: Stacked Deep Convolutional Neural Networks for Malware Classification** [Link](#)
Anil Singh Parihar, Shashank Kumar, Savya Khosla
Multimedia Tools and Applications, 2022
8. **Catastrophic Failures of Neural Active Learning on Heteroskedastic Distributions** [Link](#)
Savya Khosla, Alex Lamb, Jordan Ash, Cyril Zhang, Kenji Kawaguchi
NeurIPS 2021 Workshop on Distribution Shifts: Connecting Methods and Applications, 2021
9. **AE-DCNN: Autoencoder Enhanced Deep Convolutional Neural Network For Malware Classification** [Link](#)
Shashank Kumar*, Savya Khosla*, Shivangi Meena, Anil Singh Parihar
International Conference on Intelligent Technologies, 2021
10. **MuRIL: Multilingual Representations for Indian Languages** [Link](#)
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
ArXiv:2103.10730, 2021
Media Coverage: [Economic Times](#), [Indian Express](#), [Google AI Blog](#)

TEACHING EXPERIENCE

CS 445: Computational Photography	Urbana, IL
Teaching Assistant (Instructor: Prof. Derek Hoiem)	Aug 2023 - Dec 2023
CS 225: Data Structures and Algorithms with C++	Urbana, IL
Teaching Assistant (Instructor: Prof. Carl Evans and Prof. Brad Solomon)	Aug 2022 - May 2023

COURSES & CERTIFICATIONS

Graduate Courses

- CS 598: Machine Learning Algorithms for LLMs by Prof. Tong Zhang
- 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
- CS 491: Competitive Programming by Prof. Mattox Beckman

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

SKILLS

Languages: Python, C++, C, JavaScript, Bash

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

Tools: Git, Visual Studio, Google Cloud Platform

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