

# Ansh Khurana

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## EDUCATION

### Stanford University

MS in Computer Science with specialization in Artificial Intelligence

**GPA: 4.07**

Sep 2022 - June 2024

### Indian Institute of Technology Bombay

B.Tech with Honors in *Computer Science* and Minor in *Applied Statistics and Informatics*

**GPA: 9.75/10**

2017-2021

Received the **Research Excellence Award** for outstanding research work during undergraduate

## EXPERIENCE

### Machine Learning Engineering Intern | Apple

June 2023 - Sep 2023

*Document AI Foundation Model*

- Implemented an end-to-end pipeline for pre-training and fine-tuning a **Multimodal transformer** model
- Pre-trained the model on a large corpus (11 million documents) of data with self-supervised learning objectives
- Fine-tuned the foundation model for **extractive** and **generative** document visual question answering tasks

### Pre-Doctoral Researcher | Google Research [Publications: [Preprint](#), [ICML'22 PODS Workshop](#)]

July 2021 - Aug 2022

*Source Free Domain Adaptation*

- Proposed a **fast and hyper-parameter free** test time adaptation algorithm which uses augmented samples for reliable feature normalisation and automatically searches calibration parameters based on prediction confidence
- Obtained state-of-the-art single image test time adaptation performance with an average performance gain of **19.3%** and **12.2%** for classification and segmentation tasks respectively over the base model

### Software Engineering Intern | Google Research

May 2020 - Aug 2020

*Akshar: Robust OCR for the Next Billion Users*

- Developed a Form Structure Recognition pipeline for social care forms under the **AI for Social Good** initiative
- Identified the failure modes in current state-of-the-art techniques for Form Structure Recognition and OCR
- Proposed a novel **text guidance** based **multi-stage fusion** architecture for Table Structure Recognition

### Bachelor's Thesis | IIT Bombay [Publications: [ICPR'20](#), [ISBI'22](#)]

Dec 2020 - May 2021

*Deep-EM Learning for Medical Image Enhancement*

- Developed a novel *variational* DNN framework for image quality enhancement, relying on **Monte-Carlo EM** optimization, including Metropolis-Hastings Markov-Chain Monte-Carlo (**MCMC**) sampling in the latent space
- Proposed a robust and uncertainty-aware loss through datum-adaptive modelling on the DNN output residuals
- Won the **Best Paper Award** at the International Symposium of Biomedical Imaging (ISBI 2022)

### Research Intern | Aarhus University, Denmark [Publication: [CIKM'20](#)]

Dec 2019 - Jan 2020

*Content-Aware Influence Maximization*

- Devised a novel Content-Aware Linear Threshold (**CALT**) model that governs a contagion based on both content features and network structure, and studied the properties of the spread function under this model
- Proposed an algorithm to learn the influence parameters of the model using the **credit allocation** technique
- Developed an algorithm for efficient influence maximization by feature selection based on the model's properties

### Research Intern | National University of Singapore [Publications: [GCPR'20](#), [BMVC'20](#)]

May 2019 - July 2019

*Multi-Step Fusion for Interactive Image Segmentation*

- Worked on improving the Fully Convolutional Networks (**FCN**) approach towards interactive image segmentation
- Developed a generic framework using **PyTorch** to train and evaluate the model using multiple click sampling strategies to simulate human interaction and methods to encode the clicks into guidance maps

## TECHNICAL SKILLS

### Languages

Python, C++, C, Java, Bash, HTML/CSS, JavaScript, SQL, Prolog, LISP

### Tools and Libraries

PyTorch, TensorFlow, JAX, scikit-learn, Kaldi, OpenCV, Django, Git,  $\LaTeX$

## POSITIONS OF RESPONSIBILITY

**Teaching Assistant** - for Deep Multi-Task and Meta Learning (**Head TA**), Natural Language Processing with Deep Learning, Deep Reinforcement Learning, Computer Vision Foundations at Stanford University

**Reviewer** - for CVPR 2022, ECCV 2022, ISBI 2022 and ICPR 2022 machine learning conferences

**Department Academic Mentor** - for sophomore students in the Computer Science department, IIT Bombay