Ansh Khurana

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EDUCATION

Stanford University **GPA: 4.07**
MS in Computer Science with specialization in Artificial Intelligence *Sep 2022 - June 2024*

Indian Institute of Technology Bombay **GPA: 9.75/10**
B.Tech with Honors in *Computer Science* and Minor in *Applied Statistics and Informatics* *2017-2021*
Received the **Research Excellence Award** for outstanding research work during undergraduate

WORK AND RESEARCH 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: CVPR'23 CVinW, ICML'22 PODS] 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 normalization 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