Ansh Khurana

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EDUCATION

Stanford University
MS in Computer Science with specialization in Artificial Intelligence   *2022-Present*

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
Relevant Coursework: Advanced Machine Learning, Automatic Speech Recognition, Intelligent Learning Agents, Medical Image Computing, Operating Systems, Software Systems Lab, Database and Information Systems

WORK EXPERIENCE

Pre-Doctoral Researcher | Google Research [Publications: Preprint, ICML'22 PODS Workshop]   July 2021 - Aug 2022
· Proposed a **fast and hyper-parameter free** test time adaptation algorithm that 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
· 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

Research Intern | Aarhus University, Denmark [Publication: CIKM'20]   Dec 2019 - Jan 2020
· 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
· Implemented Fully Convolutional Networks **(FCN)** with encoded guidance maps for 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

SELECT PROJECTS

Deep-EM Learning for Medical Image Enhancement [Publications: ICPR'20, ISBI'22]   IIT Bombay
· 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)

Secure Personal Cloud [code]   IIT Bombay
· Implemented a **Zero-Knowledge** based secure cloud using RSA, ARC4, Blowfish and AES-CBC block level file encryption at the client side to ensure secure end-to-end encrytion while uploading and sharing files
· Developed a server with **Django** web framework at the back-end integrated with an **SQL** database
· Designed a **mobile-friendly** web-app using JavaScript for decrypting and rendering users' encrypted files

Virtual Reader   IIT Bombay
· Designed a headgear with a **Raspberry Pi 3** and a camera capable of newspaper OCR and image classification
· Preprocessed images using Canny Edge Detection and Wolf-Jolion thresholding with **OpenCV** library
· Built a companion **Android app** deployed with **Tesseract OCR** engine and a text-to-speech synthesizer

TECHNICAL SKILLS

Languages   Python, C++, C, Java, Bash, HTML/CSS, JavaScript, SQL, Prolog, LISP
Tools and Libraries   PyTorch, TensorFlow, JAX, R, MATLAB, Kaldi, OpenCV, Django, Git, LaTeX

HONORS AND AWARDS

■ Awarded the **JN Tata Fellowship** for pursuing higher education in computer science   *(2022)*

■ Received the **Institute Academic Prize** at IIT Bombay for exceptional academic performance   *(2020)*

■ Secured **All India Rank 39** in **JEE Advanced** among **220,000** aspirants   *(2017)*