# Ansh Khurana

✉ anshk@stanford.edu | 🌐 Website | 🐙 GitHub | 💼 LinkedIn | 📞 +1 (669) 786 4847

## 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

## TECHNICAL SKILLS

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|---|---|
| **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)*

## POSITIONS OF RESPONSIBILITY

**Teaching Assistant** - for Computer Vision, Machine Learning, Data Structures and Algorithms, and Calculus courses
**Reviewer** - for CVPR 2022, ECCV 2022, ISBI 2022, ICPR 2022 and AAAI 2023 machine learning conferences
**Department Academic Mentor** - for sophomore students in the Computer Science department, IIT Bombay