Akkapaka Saikiran

MSc CS Student, ETH Zürich

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Education

ETH Zürich (Eidgenössische Technische Hochschule) *2022–2024*
Computer Science MSc, *major:* Visual Computing, *minor:* Machine Learning *CPI: 5.44 / 6.00*

Indian Institute of Technology Bombay *2018–2022*
B.Tech. with *Honours* in Computer Science and Engineering *CPI: 9.15 / 10.00*

Experience

Image and Video Synthesis guided by Key-frame Rendering *Sept 2024 - present*
Disney Research Studios *Master's Thesis*
- Investigating opportunities for simplifying the **rendering** process by leveraging **generative models**
- Designing and evaluating novel approaches to accelerate rendering without compromising quality

Diffusion Models for Anonymization *Oct 2023 - Jun 2023*
Egonym AG *Research Engineer Internship*
- Worked on **photorealistic anonymization** to safeguard **visual privacy** in a data-driven world
- Benchmarked and evaluated various methods for high-quality **generation and editing of faces**
- Built a pipeline based on **diffusion models** for high-fidelity and controllable anonymization

Explainable Recommender Sysytems *Jun 2022 - Jul 2022*
Abacus.ai *Research Internship*
- Led a comprehensive **literature review** on explainability in recommendation systems
- Contributed to the design of a unified **recommender system framework** to analyze explainability

Self-supervised Learning of Multimodal Representations | [Report] *Jul 2021 - Dec 2021*
Prof. Preethi Jyothi and Prof. Ganesh Ramakrishnan, IITB *Bachelor's Thesis*
- Explored self-supervised pre-training strategies to learn joint audio-video-text representations
- Experimented with **contrastive** losses and extended them to three modalities using mixup
- Performed controlled studies on a tri-modal **synthetic dataset** to compare various techniques

Bing Ads Classification using Multimodal Learning | [Presentation] *May 2021 - July 2021*
Microsoft India R&D *Data Science Internship*
- Worked on improving **Microsoft's** Bing Ads classification module using **vision-language** models
- Experimented with recent models that combine word embeddings and object detection features
- Designed & finetuned a multimodal pipeline and benchmarked it against in-house baselines

Sketch-based Modeling | [Report] *Jan 2021 - Apr 2021*
Prof. Parag Chaudhuri, IITB *Research Project*
- Surveyed various approaches of generating **3D models** from user-drawn 2D or 3D sketches
- Worked on devising a novel system to generate smoothly-connected **Bézier patches** to fit sketches

Analysis of Vector Addition Systems | [Report] *Apr 2020 - Jun 2020*
Prof. Alain Finkel, ENS Paris-Saclay *Research Internship*
- Studied vector addition systems, a formal framework to describe distributed systems
- Wrote proofs and worked on devising algorithms for problems on reachability sets of VASs

Technical Skills

Languages	C/C++, Python, MATLAB, HTML/CSS, Javascript, Java, SQL
Tools & Libraries	PyTorch, TensorFlow, Git, GDB, Ghidra, Wireshark, OpenGL Spark, NodeJS

Selected Academic Projects

Fooling Neural Networks | *Fairness and Explainability in ML* | [Code] *Autumn 2021*

- Implemented **adversarial attacks** on NNs by optimizing the likelihood of false predictions
- Optimized using gradient descent instead of L-BFGS to study incremental properties of attacks
- Performed analysis on the **transferability** of these attacks and the **ease of fooling** across classes

Hospital Management System | *Database Systems* | [Code] *Spring 2021*

- Developed a patient-centric hospital management system as a **web app** which provides functionalities such as book/cancel appointments, buy medicines, pay bills, add prescription, etc.
- Added **secure access** to patients' details & history and an interface to view disease analytics

FMX Modeling and Animation | *Computer Graphics* | [Code] [Movie] *Autumn 2020*

- Modeled a bike, a rider, and a track in **OpenGL** and rendered it using shading and texturing
- Animated the above scene to create a **short movie** of an FMX rider performing stunts

Image Segmentation | *Medical Image Computing* | [Code] *Spring 2020*

- Segmented **medical images** (skin cancer, retinal vessels) using deep neural networks
- Built on top of the **U-Net architecture**, augmenting it with **residual connections** and recurrence

Foreshadow (L1TF) Attack | *Computer Architecture* | [Report] *Autumn 2020*

- Explored and imitated Foreshadow, a **speculative execution attack** on Intel's processors which allows attackers to steal sensitive information from personal computers or third-party clouds
- Presented a proof-of-concept by simulating SGX's **abort page semantics** to showcase an attack

Selected Coursework

Visual Computing	Computer Vision, Computer Graphics, Shape Modeling and Geometry Processing, Math Foundations of CG and CV, Advanced Methods in CG
Machine Learning	Machine Perception, Medical Image Computing, Reliable and Trustworthy AI, Intelligent and Learning Agents, Introduction to Machine Learning
Miscellaneous	Databases, Software Systems Lab, Big Data, Quantum Information Processing, Operating Systems, Computer Architecture, Cloud Computing

Responsibilities

- **Teaching Assistant**
  - Computer Graphics (252-0543-01L) | Prof. Markus Gross, Marios Papas *Sept 2024 - Dec 2024*
  - Logic for CS (CS228) | Prof. S. Krishna, Prof. Ashutosh Gupta *Jan 2022 - Apr 2022*
  - Operating Systems (CS333, CS347) | Prof. Mythili Vutukuru *Aug 2021 - Dec 2021*
  - Calculus (MA109) | Prof. Ravi Raghunathan *Nov 2020 - Jan 2020*
  - Logic for CS (CS228M) | Prof. S. Krishna *Jul 2020 - Dec 2020*

Academic Achievements

- Secured All India Rank 304 in IIT JEE Mains 2018 *2018*
- Secured All India Rank 665 in IIT JEE Advanced 2018 *2018*
- Awarded the Kishore Vaigyanik Protsahan Yojana (KVPY) fellowship (twice) *2016 & 2017*
- Received the prestigious National Talent Search Examination (NTSE) scholarship *2016*

Extra-curricular Activities

- Represented IIT Bombay at the 34th **Inter IIT Aquatics Meet**, held at IIT Guwahati *2018*
- Swam continuously for **12 hours** covering **19** kms at **Swimathon**, IITB's swim marathon *2019*
- Hosted Mood Indigo's spell bee competition as the **quiz master** for two years *2018 & 2019*
- Bagged trophies in **mridangam** competitions at many music societies in Mumbai *2016-2018*