ROHAN KARNAWAT

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Interests: Image Processing and Computer Vision, Software Development, ML and DL, Data Analysis, Artificial Intelligence

EDUCATION

UNIVERSITY OF SOUTHERN CALIFORNIA
MS in Computer Science | 3.75
Batch of 2021 | Los Angeles

IIIT HYDERABAD
BTech with Honors, Computer Science | 9.13
Batch of 2018 | Hyderabad
Dean's List (x3) Merit List (x2)

SKILLS

LANGUAGES
Proficient:
• C/C++ • Python • HTML+CSS
• MySQL
Familiar:
• Matlab • Javascript • Angular
• Android • Latex • Bash

TOOLS
• Tensorflow • Pytorch • CPLEX
• Docker • ImaTest • OpenCV

COURSEWORK

GRADUATE
Analysis of Algorithms
Multimedia System Design
Database Systems
Deep Learning and Applications
Artificial Intelligence
Advanced Computer Vision

UNDERGRAD CORE
SM in AI
Operating Systems
Artificial Intelligence
Digital Image Processing & CV
Optimization Methods
Distributed Systems
Music, Mind & Technology
Database systems & Advanced Networks

TA-SHIP
Computer Vision
SM in AI
Digital Signals

EXPERIENCE

IRIS, INFO SCIENCES INST. | Student Researcher | Advisor: Prof. Ram Nevatia
March 2020 – Present | Los Angeles, USA

- Researching to transform and represent images to make them robust against adversarial attacks. Using and contributing to IBM's Adversarial Robustness Toolbox and TwoSixLab's armory-testbed.

SAMSUNG | Software Development Engineer, Advanced Technology Lab
July 2018 - August 2019 | Bangalore, India

- Developed real-time ML and DL solutions for mobile devices covering areas of **Visual semantic role labelling**, **Human-object interaction**, and **Biometrics and Authentication**.
- Managed weekly releases for **AI Gallery** module on flagship mobile devices. Responsible for image post-processing, model updates and error reporting.

DIGITANT | Web Developer
September 2015 – December 2015 | Hyderabad, India

- Designed a page rank algorithm for subscribers to deploy recommendation engines on content publishing sites. Built a dashboard to facilitate tracking & traffic analysis.

RESEARCH

CVIT, IIIT-H | Honors Student | Advisor : Dr Anoop Namboodiri
June 2016 – May 2018 | IIIT, Hyderabad

- Designed an expressiveness classifier from upper body POSE (video) and audio recordings of meetings using a dual-input CNN. Generated indexed summaries by combining the 2 phases, reported 91.8% accuracy with a keyword based search.

PROJECTS

COMIC STRIP GENERATION : Designed an end-to-end model using Pix2Pix based C-GAN along with fine-tuned LSTM and experiments with VQA based joint embedding and InfoGAN to generate alternate endings to Garfield comic strips *(Pytorch)*

MULTIMEDIA SYNOPSIS : Created an interactive video synopsis player of a large media directory enabling synchronized browsing and viewing of raw videos and images using Python-QT. *(C++, Python)*

MUSIC GENRE CLASSIFICATION : Built an unsupervised learner (Kmeans + KL Divergence) and a supervised classification ensemble (Random Forest, DNN and DAG-SVM). With 87.8% accuracy, classified songs into 5 genres. Extended scope to a mood based music recommendation engine. *(Tensorflow)*

CONTENT AWARE IMAGE RESIZING : Implemented resizing of images using the Patch-matching approach based on an approximate nearest neighbor algorithm. Performed well with minimal artefact introduction. *(Python, C++)*

ULTIMATE TIC TAC TOE BOT : Developed an AI bot for Ultimate Tic-Tac-Toe and came up with a special heuristic for scoring states selected by an alpha-beta pruned minimax tree. Finished in the top 10 in a battle of 80 bots. *(C++)*

C SHELL : Developed a multi-threaded command-prompt shell and basic kernel in C from scratch, with piping and regex. *(C, C++)*