ROHIT GAJAWADA

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EDUCATION

International Institute of Information Technology, Hyderabad *August 2015 - Present*
Bachelors of Technology (Honors.)in Computer Science and Engineering CGPA: 8.22

WORK EXPERIENCE

Computer Vision Center - UAB *May 2018 - Present*
Research Internship
Working with Dr. Antonio Lopez (Advanced Driver Assistance Systems Group) on the CARLA simulator. Focusing on training end to end deep imitation learning agents for autonomous vehicles using the CARLA simulator. Also working on domain adaptation using generative models to transfer models trained in simulation to real world.

Center for Visual Information Technology - IIIT-Hyderabad *April 2017 - Present*
Undergraduate Research Assistant
Working with Dr. Anoop Namboodiri on deep model compression and binarization, applications of deep learning to biometry and generative adversarial networks. Working with Dr. Vineet Gandhi on multi object tracking.

Teaching Assistant - IIIT-Hyderabad *January 2018 - May 2018*
Computer Graphics
Contributed by teaching in tutorial sessions, setting and grading assignments and correcting exam papers.

PUBLICATIONS

Towards Hybrid Binary Networks: Optimizing for Accuracy, Efficiency and Memory accepted in *IEEE Winter Conference on Applications of Computer Vision (***WACV 2018***)*:
Investigated the question of where to binarize inputs and showed that binarizing inputs to the right areas in the CNN based network contributes significantly to accuracy while not bloating the overall computations performed. Our method is also able to binarize the last layer of the network and achieve remarkable memory saving and speed up. Our method can also be combined with other compression strategies to obtain highly efficient models with negligible accuracy penalties. We used the PyTorch framework to perform our experiments.

Distribution-Aware Binarization of Neural Networks for Sketch Recognition accepted in *IEEE Winter Conference on Applications of Computer Vision (***WACV 2018***)*:
Introduced a distribution-aware approach to binarizing deep CNN based networks that is able to take the distribution of the network's weights into account and also provided an efficient implementation of the same using dynamic programming. Our method achieves significant improvement over current full binarization approaches for CNNs on two popular sketch datasets. We used the PyTorch framework to perform our experiments.

RESEARCH PROJECTS

Multimodal OCR: *May 2017 - December 2017*
Worked on an end to end trainable multimodal deep learning model to improve word level accuracy where two CNN based networks (one for the text image and one for the stroke data) are used in a window like fashion. Their outputs are combined and passed into a Bidirectional LSTM and a transcription layer. It was tested on our own English and Malayalam multimodal datasets. The PyTorch framework was used to perform experiments.

One-Shot Multi Object Tracking: *January 2018 - Present*
Working on designing unsupervised machine learning algorithms to track and analyze players in football matches using top view registrations automatically generated from video frames.

Biometric Image Quality Metric: *September 2017 - December 2017*
The project aims to devise a new metric that can evaluate the performance of existing metrics in terms of image quality and matching accuracy. This metric would be able to guide machine learning models in enhancing biometric image quality. We used the NIST SD14 and FVC datasets for our analysis.

RELEVANT PROJECTS

Eye Gaze Detection using Attention Modelling: *November 2017*
Implemented a deep learning model that is able to follow the gaze of a person and identify the object being looked at given an image and the location of a head. The model is able to extract head pose and gaze orientation and select salient objects that are in the predicted line of sight. The PyTorch framework was used for the implementation.

Sketch Based Image Retrieval: *October 2017*
Implemented sketch based image retrieval that maps images to sketches and then efficiently indexes and searches them. The mapping is done by perceptual edge grouping that organises edges into meaningful structures based on Gestalt principles using RankSVM and graph cuts and also removes redundant edge groups by energy filtering. MATLAB and the graph cut optimization toolbox were used for the implementation.

Unsupervised CNN for Single View Depth Estimation: *February 2018 - Present*
Implemented a convolutional neural network (CNN) for single-view depth estimation that can be trained end-to-end in a fully unsupervised fashion. The PyTorch framework was used for the implementation

OTHER PROJECTS

Ultimate 4x4 Tic-Tac-Toe Bot: *February 2017*
Developed a game bot for a competitive two player game called Ultimate Tic Tac Toe that reached the semifinals in a battle of 80 bots. Minimax algorithm and alpha beta pruning were used to evaluate the best move among the numerous possible outcomes.

Brick-breaker: *January 2017*
Developed a 2D game with C++ and OpenGL from scratch where baskets must be moved to collect falling bricks, a rotating cannon must be operated to shoot certain falling bricks and bullets can be reflected off mirrors.

Bloxorz: *February 2017*
Developed a 3D game with C++ and OpenGL from scratch where a block must be moved across a terrain with several different obstacles and made to reach the goal. The game can be seen from many views and has several levels.

Aquarium Simulation: *March 2017*
Developed a 3D simulation of an aquarium with Javascript and WebGL from scratch which has several types of fish and objects. The fish move around in the aquarium and perform various actions like eating food, creating eggs and hatching from eggs.

Web-Server *March 2017*
Implemented a multi-threaded web server that is able to handle and parse HTTP and HTTPS requests using socket programming in Python.

Tetris-Clone *September 2016*
Implemented a tetris clone that is similar to the original arcade game using PyGame.

TECHNICAL SKILLS

Programming Languages	Python, C/C++, MATLAB, Bash, HTML/CSS, MySQL, PHP, Javascript
Libraries and Packages	PyTorch, Tensorflow, Keras, Caffe (basic), scikit-learn, scikit-image, CUDA (basic), OpenCV, OpenGL, WebGL
Embedded Platforms	NVIDIA Jetson TX2
Miscellaneous	GNU/Linux, Git, CARLA Simulator, LaTeX

RELEVANT COURSES

Computer Vision, Optimization Methods, Independent Study on Visual Tracking, Statistical Methods in AI, Digital Image Processing, Artificial Intelligence, Computer Graphics, ITWS I & II, Data Structures & Algorithms, Digital Signal Analysis & Applications, Computer Programming, Software Analysis & Design, Formal Methods, Math I, II & III, Computer Systems Organization, Operating Systems, Computer Networks, Differential Equations, Ethics