ANMOL POPLI

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Education:

University of California - San Diego, San Diego, CA — Graduation Mar 2020
Master of Science in Computer Science, Jacobs School of Engineering

Indian Institute of Technology - Roorkee, Roorkee, India — Jun 2018
Bachelor of Technology in Electrical Engineering, GPA - 8.7/10

Skills:

Languages C, C++, Python, Unix Shell
Tools TensorFlow, Theano, Libsvm, MATLAB, OpenCV, OpenMP, Android Studio, Git

Experience:

University of Alberta, Computer Vision based Robot-Server system — May 2017 - Aug 2017
- Programmed robot's NVIDIA Jetson processor to transmit video input over WiFi (via UDP sockets) to server
- Programmed server using OpenCV in C++ for Face Detection (Viola Jones) and Recognition (Local Binary Patterns Histograms), incorporating temporal smoothing and on-the-fly updating functionality
- Implemented speech APIs on Jetson to communicate with user, utilizing the UI data transmitted from server

Indian Institute of Science, Fast Bilateral Filter (Image Processing) — May 2016 - Jul 2016
- Implemented fast approximations of Gaussian filter in C with best execution time 50 ms and RMS error 0.04%
- Developed fast algorithm for Bilateral Filter based on discrete Fourier transform of samples of the range kernel
- Created a parallelized C library of the algorithm which is able to filter images as large as 1 MP within 1 second

Projects:

Brain Tumor Segmentation using Deep Learning — May 2018 - Aug 2018
- Trained a 3D Fully Convolutional Network in Theano to segment tumor subregions from brain MRI scans
- Optimized U-Net based 3D FCN to achieve balance of receptive field, model complexity and memory footprint
- Achieved dice scores 0.8941, 0.8248 and 0.7439 for whole tumor, tumor core and enhancing core on validation set

Diabetic Retinopathy Diagnosis using Deep Learning — Jan 2018 - Apr 2018
- Trained U-Net with weighted cross entropy loss in TensorFlow to segment retinal lesions; achieved AUPR score 0.79
- Trained 50-layer deep ResNet for disease grading, and concatenation of standard CNN and U-Net for localization
- Ranked 1st for fovea localization on IDRiD challenge with ED score 33.253; achieved grading kappa score 0.74

Frisbee Trajectory Tracking using Computer Vision — Oct 2016 - Mar 2017
- Developed a C++ application using OpenCV on Raspberry Pi for Frisbee trajectory tracking and pole detection
- Implemented parallel processing of real time video input on CPU's 4 cores using OpenMP

Satellite Image Classification — Oct 2016
- Trained an SVM classifier using Libsvm in C to classify 4-channel Satellite imagery into 7 land cover classes
- Tuned RBF kernel variance and regularization parameter through 5-fold cross-validation

Computer Vision based Robot Navigation — Oct 2015 - Mar 2016
- Developed Android application employing phone camera for vision based robot navigation; incorporating algorithms to segment and follow white line, implement motion control, and to keep track of line in presence of background noise

Publications:

Automatic Brain Tumor Segmentation using U-Net based 3D Fully Convolutional Network, *Pre-Conference Proceedings of the 7th MICCAI BraTS Challenge (2018), pp. 374-382.*

A Fast Approximation of the Bilateral Filter using the Discrete Fourier Transform, *Image Processing On Line, 7 (2017), pp. 115-130. https://doi.org/10.5201/ipol.2017.184*