Suriya Narayanan Lakshmanan

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EDUCATION

CMU, ROBOTICS INSTITUTE
MASTER'S IN COMPUTER VISION
Advised by Prof. Srinivasa Narasimhan
Dec 2018 | Pittsburgh, PA
Cum. GPA: 3.83/4.0

NIT, TIRUCHIRAPPALLI
BACHELOR OF TECHNOLOGY IN ELECTRICAL AND ELECTRONICS ENGINEERING
May 2014 | Tiruchirappalli, India
Cum. GPA: 8.8 / 10.0

COURSEWORK

Intro to Machine Learning
Intro to Computer Vision
Math fundamentals for Robotics
Visual Learning and Recognition
Deep Reinforcement Learning
Geometry based maths in Vision
Computational Photography

Algorithms and Data Structures
Operating Systems
Object Oriented Programming
Digital Signal Processing

SKILLS

PROGRAMMING
C • C++ • Python • Matlab • OpenCL • LaTeX

LIBRARIES
TensorFlow (Python and C++) • PyTorch • OpenCV • ROS • Numpy • PCL • OpenAI gym • scikit-learn

OPERATING SYSTEMS
Linux • Windows • Android

OTHER SOFTWARE
Git • Microsoft Office • GIMP

EXPERIENCE

CYNGN INC (SELF-DRIVING VEHICLE COMPANY) | PERCEPTION ENGINEER
Feb 2019 - Present | Menlo Park, USA

- Brought up traffic light detection system from scratch consisting of components such as traffic light detection, traffic light recognition, tracking and temporal smoothing with TensorRT optimizations
- Working on a 2D object detector
- Worked on single image based 3D bounding box detector for vehicles
- Analyzed the depth error of stereo and proposed stixels based obstacle detection/free space segmentation with appropriate stereo settings
- Worked on choosing camera format and lens focal length for required detection range and Field of View
- Contributed to the design of a software based Lidar-Camera synchronization system

SAMSUNG RESEARCH AMERICA | COMPUTER VISION RESEARCH INTERN
Think Tank Team
May 2018 - August 2018 | Mountain View, USA

- Developed human pose datasets for proprietary imaging sensors using unsupervised domain adaptation
- Developed a deep learning based human pose estimation network that can predict human poses on frames obtained from the proprietary imaging sensor
- Worked on deploying the above developed network by creating a C++ application using TensorFlow APIs for building and executing the deep learning graph

TEXAS INSTRUMENTS | SOFTWARE ENGINEER
July 2014 - June 2017 | Bangalore, India

- Improved accuracy of TI CNN model for driver drowsiness detection by **2x**
- Improved Adaboost classifier for object detection yielding **10%** more true detections. *[Efficient object detection and classification on low power embedded systems, ICCE 2017]*
- Accelerated a set of OpenCV functions using OpenCL and DSP which was released as part of TI Vision SDK. *[Understanding the Performance Benefit of Asynchronous Data Transfers in OpenCL Programs Executing on Media Processors, HiPC 2015]*

TEXAS INSTRUMENTS | COMPUTER VISION INTERN
May 2013 – July 2013 | Bangalore, India

- Improved an existing homography based Ground Plane Detection by **10%**. *[Ground plane detection, Patent 2017]*. *[Improved ground plane detection in real time systems using homography, ICCE 2014]*

ACADEMIC PROJECTS

UNSUPERVISED SEGMENTATION DATA GENERATION
October 2018 - December 2018 | CMU, Pittsburgh
Interpolated semantic segmentation labels between key frames in a video using dense depth as supervision

RGB SUPER SLOMO USING HIGH FPS DYNAMIC VISION SENSOR
October 2018 - December 2018 | CMU, Pittsburgh
Developed a deep learning network to produce high frame rate RGB video from a low frame rate RGB video using optical flow derived from high frame rate dynamic vision sensor video as supervision

SMART RECONSTRUCTION
January 2018 - May 2018 | ILIM Lab, CMU, Pittsburgh
Reconstructed traffic from a single stationary camera using keypoint detetion, tracking and geometric constraints while stabilizing the camera

WEAKLY SUPERVISED OBJECT DETECTION
March 2018 - March 2018 | CMU, Pittsburgh
Implemented weakly supervised object detection algorithm: WSDDN

SCENE CLASSIFICATION
September 2017 | CMU, Pittsburgh
Performed scene classification using Spatial Pyramid Matching from scratch

DIGITAL ART USING SFM
October 2017 - November 2017 | CMU, Pittsburgh
Developed an application to create portrait effect from single camera using SFM and 3D segmentation

INTELLIGENT INPAINTING
October 2017 - November 2017 | CMU, Pittsburgh
Developed an application that removes a person from an image from a single click using pedestrian detection, semantic segmentation and exemplar inpainting

PUBLICATIONS

- Improved ground plane detection in real-time using homography, ICCE
- Understanding performance benefit of asynchronous data transfers in OpenCL programs executing on media processors, HiPC