

SHRUTHI NARASIMHE GOWDA

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EDUCATION

MS – Electrical and Computer Engineering [Sep 2010-Sep 2012] [Computer Vision, Machine Learning]	UPC (Universitat Politècnica de Catalunya), Spain UCL (Université Catholique de Louvain), Belgium	GPA - 8.14/10 (<i>'cum laude'- the highest grade</i>)
BE - Electronics and Communication Engineering [Jun 2006-Jun 2010]	B.M.S College of Engg, Visvesvaraya Tech. University, India	Grade - 86% (<i>First Class with Distinction</i>)

WORK

- NI VISION R&D, National Instruments, India – **Senior Software Engineer** [2018 - present], Advanced Staff Software Engineer [2017- present], Staff Software Engineer[2015-2017], Software Engineer[2013-2015]
- Image and Signal Processing group (ISP), UCL, Belgium - **Research Assistant** [Jan 2012-Sep 2012]
- DRDO (Defense Research and Development Organization), India – **Intern** [Jan 2010-Jun 2010]
- M.P. Birla Institute of Fundamental Research, India - **Research Associate** [Sep 2007-Sep 2008]

AREAS AND SKILLS

Digital Image Processing. Computer Vision. Pattern Matching. 3D Vision.
Machine Learning. Deep Learning.

Deep Learning Libraries: TensorFlow, Keras, Caffe, Intel DAAL
Programming Languages: C, C++, Python, LabVIEW, MATLAB
Software Optimizations: SSE, Intel CILK, Intel IPP, TBB (Multicore)
Open Source: OpenCV, OpenCL, PCL

Certifications: Machine Learning and Deep Learning courses on Coursera and DeepLearning.ai

KEY PROJECTS

- NI VISION, National Instruments (NI) R&D, India

Deep Learning Research [Oct 2017 – present] – Generalized Defect Inspection using Deep Learning to cater to diverse Inspection cases. Leading a team of 2 on different research threads on training, model optimization and inference. Accuracy and Benchmark results tested with different libraries on different platforms.
Models: LeNet, AlexNet, VGG-16, GoogLeNet, SSD MobileNet and Custom Models
Inference Research: IntelVINO ; Devices : CPU, GPU, Intel Movidius NCS ; Libraries: TensorFlow, Caffe, Intel DAAL

Pattern Matching [Aug 2015 - Mar 2016] – Implemented a robust Pyramidal-based Pattern Matching feature: Grayscale and Gradient Pattern matching. Learning phase extracts gray value and/or edge gradient information from and stores, in the template image and Matching phase detects matches by locating regions in the inspection image with the highest NCC score. Optimizations include Pyramid-level logic on the algorithm side and using IPP functions and multi-coring on the software side.

Barcode Localization, Decoding and Grading [Sep 2013 – Aug 2014] - Researched, prototyped and productized 1D Barcode feature. Detects and localizes multiple barcodes in an image using segmentation and Decodes the barcode using standard ANSI Barcode decoding logic.
Barcodes Formats: Code 25, Code 39, Code 93, Code 128, EAN 8, EAN 13, Codabar, MSI, UPC A

Object Tracking [Jan 2013 - Aug 2013] - Researched, prototyped and productized tracking feature that uses Continuously Adaptive Mean Shift algorithm to track multiple objects across frames. Histogram Back Projection and Kalman Filter Prediction were added to improve results.

Implementation Details for all above projects: Code in C++, API in LabVIEW, Deployed on Windows, Pharlap and Linux x64 RT targets

- UCL, Belgium

MASTER THESIS: Virtual Viewpoint Reconstruction in a Multi-Camera Network [Jan 2012-Sep 2012]
The thesis proposes a method towards reconstruction of dynamic regions in a scene in any virtual viewpoint in a multi-view environment using Epipolar *Geometry* and View Interpolation. Color Camera Calibration was implemented to learn the right camera parameters for multiple cameras.

Details: Implemented in MATLAB

Automated Electrocardiogram Prediction using Neural Networks [Sep 2011-Nov 2011]

Implemented several regression models, namely Linear Regression, kNN and Radial Basis Function Network models and analysed the results, to predict one beat of an ECG signal from a given one wave of the signal.

Details: Implemented in MATLAB

- Defense Research and Development Organization, India

THESIS: Fixed point IF Filter implementation on FPGA for Radar Signal Processing [Jan 2010- Jun 2010]

MENTORING EXPERIENCE

- **Different ways to Calibrate Stereo Vision System** [Jan 2017 – Mar 2017] - **Mentored** an intern on improving efficiency and usability while calibrating a Stereo Camera: Single Calibration Grid, Multiple Grids, no grids. Experiments using checkerboard instead of the existing DotGrid.
- **3D Vision research** [Jan 2016 – Jun 2016] – **Mentored** an intern on depth map calculation using Stereo Camera Calibration Setup. Analysis of Depth Map to provide 3D Metrology and Measurements.
- **Feature Extraction and Classification** [Jan-2014 – June 2014] - **Mentored** an intern on feature extraction. Experimented HOG & LBP feature descriptors and SVM classifiers for Classification applications.

PUBLICATIONS [INTERNAL]

- *"Defect Detection using different Computer Vision Algorithms and Finding a Generalized Defect Inspection System using Deep Learning"*, NITech Conference 2016, NI R&D, Austin
- *"Analysis of Superpixels on existing Vision Algorithms"*, NITech Conference 2014, NI R&D, Austin
- *"Steganography in images using DWT and Skin Detection Biometrics"*, NITech 2013, NI R&D, Austin

AWARDS AND HONOURS

- **ENGINEERING EXCELLENCE AWARD** (2016) – In Recognition of excellent work and dedication in bringing out innovative ideas and products in NI R&D - by National Instruments, Austin, Texas
- **ROOKIE OF THE YEAR AWARD** (2013) – In Recognition for the outstanding achievement and contribution of an employee to the company - by National Instruments, Austin, Texas
- **ERASMUS MUNDUS SCHOLARSHIP** (2010-2012) – The most prestigious fellowship offered by European Union to 10 International Students every year; to study in consortia of universities across Europe
- **PRATIBHA PURASKAR** (2006) – Honor by the Indian Govt. for the top 0.1% of top scorers in Class 12.