

Vikram Voleti

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RESEARCH INTERESTS	To work at the intersection of computer vision and machine learning towards artificial intelligence; to understand and apply learning techniques such as deep neural networks to vision-related research	
EDUCATION	Indian Institute of Technology (IIT), Kharagpur, India Dual Degree (B.Tech. (H) + M.Tech.) in Electrical Engineering with Master's specialization in Instrumentation and Signal Processing	2009 - 2014 CGPA: 8.44 / 10
RESEARCH PAPERS	Journal: [1] S. Jonna, S. Satapathy, <u>V. S. Voleti</u> , R. R. Sahay, "Unveiling the scene: A Multimodal Framework for Simultaneous Image Disocclusion and Depth Map Completion using Computational Cameras," <i>International Journal of Computer Vision</i> , 2017 (under review) Conference: [2] <u>V. Voleti</u> , "Carry-Free Implementations of Arithmetic Operations in FPGA" in <i>Proc. 24th National Conference on Communications</i> , 2018 (under review) [pdf] [3] <u>V. Voleti</u> , P. Mohan, S. Gupta, J. Iqbal, "Simple Real-Time Pattern Recognition for Industrial Automation," in <i>Proc. International Conference on Industrial Design Engineering</i> , 2017 (under review) [pdf] [4] S. Jonna, <u>V. S. Voleti</u> , R. R. Sahay, and M. S. Kankanhalli, "A Multimodal Approach for Image De-fencing and Depth Inpainting," in <i>Proc. Int. Conf. Advances in Pattern Recognition</i> , 2015, pp. 1–6 [pdf , IEEE]	
CURRENT WORK	Research Intern — Applied Research Lab INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY (IIIT) - HYDERABAD, INDIA <i>Under Prof. C. V. Jawahar, Centre for Visual Information Technology, IIIT-Hyderabad</i>	May 2017 - present <ul style="list-style-type: none">• Towards weakly supervised lipreading using deep neural networks• Analyzing the effect of visual attributes such as head pose, facial landmarks on visual speech recognition datasets such as GRIDcorpus, Lipreading-in-the-wild (LRW)• Experimenting with convolutional and recurrent neural networks for self-training on unlabelled data
WORK EXPERIENCE	Image Processing Engineer — Embedded Systems Team GREYORANGE ROBOTICS, INDIA — <i>a multinational firm that designs, manufactures and deploys advanced robotics systems for automation at warehouses, distribution and fulfillment centres</i>	February 2016 - May 2017 <ul style="list-style-type: none">• Developed computer vision module to perform video processing in real time for warehouse automation• Optimized and implemented vision and learning algorithms for faster pattern recognition• Experimented with CNNs on GPU for classification of objects on warehouse conveyor belts• Developed embedded vision modules in automated guided robots for warehouses• Research paper [3] based on work is under review at ICIDE 2017, for publication by ACM Associate Engineer — Avionics Software & Systems Testing Group AIRBUS, INDIA — <i>a commercial aircraft manufacturer, the largest aeronautics & space company in Europe</i> <ul style="list-style-type: none">• Involved in development and integration of avionics systems for the long-range aircrafts family• Simulated signal-level modifications to the Flight Warning Computer, adopting standard avionics coding guidelines (DO-178B)
RESEARCH PROJECTS	"De-fencing of Images using RGB-D Data" — M.Tech. Thesis IIT KHARAGPUR — <i>Prof. Rajiv Sahay, Department of Electrical Engineering</i>	2013 - 2014 <ul style="list-style-type: none">• Elimination of fence-like occlusions, inpainting of images using RGB-D data• Nominated for Best M.Tech. Project Award among three departments (Electrical, Electronics, CS)• Research paper [4] based on work is published in the proceedings of ICAPR 2015 in IEEE Xplore• Co-authored journal paper [1] is under review at the International Journal of Computer Vision (IJCV)• Links — GitHub repository containing thesis, presentation, codes, and related files

“Identification of Bilabial Consonants in Audio and Lip Closures in Video” — B.Tech. Thesis
IIT KHARAGPUR — *Prof. Rajiv Sahay, Department of Electrical Engineering* 2012 - 2013

- Measurement of synchronization between audio and video using bilabial cues in both modes
 - Trained a Gaussian Mixture Model (GMM) in MATLAB with MFCCs extracted from audio
 - Devised a C++ program to identify lip closures in video using OpenCV modules
- Links — [GitHub repository](#) containing [thesis](#), [presentation](#), codes, and related files

RESEARCH KU LEUVEN, BELGIUM — *Prof. Ingrid Verbauwhede, Computer Security & Industrial Applications* Summer 2013

- Designed and implemented addition, subtraction, multiplication using Carry-Free Logic
- Developed, tested and verified the modules in Verilog, and simulated circuits in Xilinx
- Single-author research paper [2] is under review at the 24th Indian National Conference on Communications (NCC) 2018, for publication in IEEE Xplore
- Links — [GitHub repository](#) containing [report](#), [presentation](#), and related files

“Fingertip Gesture Recognizer using HMMs” Summer 2012
IIT KHARAGPUR, INDIA — *Prof. Aurobinda Routray, Department of Electrical Engineering*

- Implemented Hidden Markov Models (HMMs) in MATLAB, verified with standard implementations
- Created a program that recognizes shapes drawn by fingertip using HMM
- Links — [GitHub repository](#) containing [report](#), [presentation](#), and related files

“Measurement of Intra-die Power Variation in Sub-nm FPGA’s” Summer 2011
IMPERIAL COLLEGE, LONDON — *Prof. Peter Cheung, Head, Electrical and Electronics Engineering*

- Measured the relative power consumption among the LookUp Tables (LUTs) of an FPGA
- Designed and implemented an automated workflow for signal processing, and visualization of results
- Links — [GitHub repository](#) containing [presentation](#), and related files

TECHNICAL SKILLS **Languages :** C, C++, HTML/CSS, Javascript, Python, MATLAB, Shell, Verilog
Operating Systems: OS X, Unix/Linux, Windows
Libraries: CUDA, IDS (cameras), Keras, L^AT_EX, OpenCV, PyTorch, Tensorflow

- SCHOLASTIC ACHIEVEMENTS
- Attended summer schools on [Computer Vision](#) and [Machine Learning](#) at IIIT-Hyderabad in 2017
 - Stood 3rd in Computer Vision Summer School out of 120+ participants, rewarded full fee waiver
 - Stood 4th in Machine Learning Summer School out of 120+ participants, rewarded full fee waiver
 - Talk: “Mathematics of back-propagation in multi-layer perceptrons” [\[link\]](#)
 - Lecture given at GreyOrange Robotics, India, and at IIIT-Hyderabad
 - Completed *additional* courses in Computer Science & Engineering at IIT Kharagpur
 - Algorithms-I, Artificial Intelligence, Computational Number Theory
 - Achieved highest grade in Digital Voice & Picture Communication, Programming & Data Structures, Real Time Signal Processing lab., Digital Electronic Circuits, Control & Electronic System Design, Power Systems lab., Total Quality Management, Transform Calculus, Game Theory & Applications
 - Participated in Amazon Data Science competition in MVSP 2012, Kaggle competitions, Coursera courses on machine learning, computer vision, neural networks, natural language processing
 - Qualified JEE 2009 by IIT at 99.7 percentile, with All India Rank of 1330 (out of 384,977)

RELEVANT COURSES **Computer Science & Engineering:** Algorithms-I, Artificial Intelligence, Computational Number Theory, Computer Architecture & Operating Systems
Computer Vision and Multimedia: Digital Image Processing & Applications, Digital Voice & Picture Communication, Vision & Visualization
Signal Processing, Embedded Systems: Analog Communication, Analog Signal Processing, Data Communication Networks, Digital Electronic Circuits, Digital Signal Processing, Programmable & Embedded Systems, Real Time Signal Processing, Signals & Networks, Statistical Signal Processing
Mathematics & OR: Probability & Stochastic Processes, Transform Calculus, Game Theory & Applications, Total Quality Management

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