



ONLINE	Website: voletiv.github.io	GitHub: github.com/voletiv	LinkedIn: Vikram Voleti
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	Dual Degree (B.Tech. (H) + M.Tech.) in Electrical Engineering 2009 - 2014 with Master's specialization in Instrumentation and Signal Processing INDIAN INSTITUTE OF TECHNOLOGY (IIT), KHARAGPUR 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 (accepted) [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 — <i>Applied Research Lab</i> May 2017 - present INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY (IIIT) - HYDERABAD, INDIA <i>Prof. C. V. Jawahar, Centre for Visual Information Technology, IIIT-Hyderabad</i> <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 — <i>Embedded Systems Team</i> February 2016 - May 2017 GREYORANGE ROBOTICS, INDIA — <i>a multinational firm that designs, manufactures and deploys advanced robotics systems for automation at warehouses, distribution and fulfillment centres</i> <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 has been accepted at ICIDE 2017, for publication by ACM Associate Engineer — <i>Avionics Software & Systems Testing Group</i> July 2014 - February 2016 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 2013 - 2014 IIT KHARAGPUR — <i>Prof. Rajiv Sahay, Department of Electrical Engineering</i> <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, code files, and results 		

“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](#), code files, and results

RESEARCH KU LEUVEN, BELGIUM — **“Implementation of Carry-Free Arithmetic Operations in FPGA”** *Summer 2013*
INTERNSHIPS *Prof. Ingrid Verbauwhede, Computer Security & Industrial Applications*

- 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](#), code files, and results

“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
- Implemented an automated workflow for power measurement, and visualization of results in MATLAB
- Links — [GitHub repository](#) containing [presentation](#), certificate, and recommendation letter

TECHNICAL SKILLS **Languages :** C, C++, HTML/CSS, Javascript, Python, MATLAB, Shell, Verilog
Operating Systems: OS X, Unix/Linux, Windows
Libraries: CUDA, IDS (cameras), Keras, \LaTeX , 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
 - Won the SMS Classification challenge in the 2017 [Hack2Innovate](#) hackathon in Bangalore, India
 - Awarded the Order of Merit by IIT Kharagpur upon graduation in 2014
 - 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