# Vikram Voleti

**Online:** *Website* — voletiv.github.io, *GitHub* — github.com/voletiv, *LinkedIn* — Vikram Voleti
**DOB:** April 29th, 1992
**Contact:** vikram.voleti@gmail.com, +91 77600 53663
**Address:** AB-603, Aparna Cyberzon, Nallagandla, Hyderabad, India - 500019

## EDUCATION

**Dual Degree (B.Tech. (H) + M.Tech.) in Electrical Engineering** *Graduated 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, V. S. Voleti, R. R. Sahay, "Unveiling the scene: A Multimodal Framework for Simultaneous Image Disocclusion and Depth Map Completion using Computational Cameras," *International Journal of Computer Vision*, 2017 (under review)

**Conference:**

[2] V. Voleti, "*Carry-Free Implementations of Arithmetic Operations in FPGA*" in *Proc. 24$^{th}$ National Conference on Communications*, 2018 (under review) [pdf]

[3] V. Voleti, P. Mohan, S. Gupta, J. Iqbal, "Simple Real-Time Pattern Recognition for Industrial Automation," in *Proc. International Conference on Industrial Design Engineering*, 2017 (accepted) [pdf]

[4] S. Jonna, V. S. Voleti, R. R. Sahay, and M. S. Kankanhalli, "A Multimodal Approach for Image De-fencing and Depth Inpainting," in *Proc. Int. Conf. Advances in Pattern Recognition*, 2015, pp. 1—6 [pdf, IEEE]

## CURRENT WORK

**Mentor** — *Foundations of Artificial Intelligence and Machine Learning* *January 2018 - present*
IIIT Hyderabad, India — *six months certificate program for software professionals*
- Mentoring industry professionals in lab sessions by teaching machine learning concepts

**Research Intern** — *Applied Research Lab* *May 2017 - present*
International Institute of Information Techonology - Hyderabad, India
*Prof. C. V. Jawahar, Centre for Visual Information Technology, IIIT-Hyderabad*
- Towards weakly supervised lipreading using deep neural networks
- Experimenting with convolutional and recurrent neural networks for self-training on unlabelled datasets

## WORK EXPERIENCE

**Image Processing Engineer** — *Embedded Systems team* *February 2016 - May 2017*
GreyOrange Robotics, India — *a multinational firm that designs, manufactures and deploys advanced robotics systems for automation at warehouses, distribution and fulfillment centres*
- Developed computer vision module to perform video processing in real time for warehouse automation
- Implemented machine learning algorithms in C++ for pattern recognition
- Experimented with CNNs on GPU for classification of objects on warehouse conveyor belts
- Research paper [3] based on work has been accepted at ICIDE 2017, for publication in ACM

**Associate Engineer** — *Avionics Software & Systems Testing group* *July 2014 - February 2016*
Airbus, India — *a commercial aircraft manufacturer, the largest aeronautics & space company in Europe*
- Involved in development and integration of avionics systems for the long-range aircraft family
- Simulated signal-level modifications to the Flight Warning Computer, adopting DO-178B coding guidelines

## RESEARCH PROJECTS

**"De-fencing of Images using RGB-D Data" — M.Tech. Thesis** *2013 - 2014*
IIT Kharagpur, India — *Prof. Rajiv Sahay, Department of Electrical Engineering*
- 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 project 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, India — *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 INTERNSHIPS

**"Implementation of Carry-Free Arithmetic Operations in FPGA"** *Summer 2013*
KU Leuven, Belgium — *Prof. Ingrid Verbauwhede, Computer Security & Industrial Applications research group*

- Designed and implemented addition, subtraction, multiplication, modular reduction 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 24$^{th}$ 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, Department of Electrical and Electronics Engineering*

- Measured the relative power consumption among the LookUp Tables (LUTs) of an FPGA
- Implemented an automated workflow for signal processing, and visualization of results in MATLAB
- Links — GitHub repository containing presentation, certificate, and recommendation letter

## TECHNICAL SKILLS

**Programming** : 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 3$^{rd}$ in Computer Vision Summer School out of 120+ participants, was rewarded full fee waiver
  - Stood 4$^{th}$ in Machine Learning Summer School out of 120+ participants, was rewarded full fee waiver
- Talk: "Mathematics of back-propagation in multi-layer perceptrons" [link]
  - Lecture given at GreyOrange Robotics, India, and IIIT-Hyderabad
- Won the SMS Classification challenge in the 2017 Hack2Innovate hackathon in Bangalore, India
- Awarded the Order of Merit by Indian Institute of Technology (IIT), Kharagpur, upon graduation in 2014
- Completed *additional* courses in the department of Computer Science & Engineering at IIT Kharagpur — Algorithms-I, Artificial Intelligence, Computational Number Theory
- Achieved "**EX**cellent" (highest) grade in Digital Voice & Picture Communication, Programming & Data Structures, Real Time Signal Processing lab., Digital Electronic Circuits, 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)

## OTHER ACTIVITIES

- French — completed the A1-level course by Alliance Française de Delhi, Gurgaon centre
  - Languages known — Telugu (native), English (fluent), Hindi (fluent), French (novice)
- Speedcuber — participated in Rubik's cube solving competitions by World Cube Association
- Debate — headed organization of IIT Kharagpur Model United Nations 2013, participated in other MUNs
- Dramatics — part of the English dramatics club of IIT Kharagpur since 2009, promoted to Governor in 2011, participated and won medals in 15 drama competitions in India, including "Best Actor" in 2010
- Movie reviewer — movie reviews on my blog [link], published on multiple websites