Vikram Voleti

Online — *Website*: voletiv.github.io *GitHub:* github.com/voletiv *LinkedIn*: Vikram Voleti

Current Education — **PhD student at Mila**, with Prof. Chris Pal *Joined in Fall 2018*
University of Montreal, Canada

Current Projects
- Building a deep generative model for sculptures in 3D using images rendered in Blender
- Visual Reasoning via Language Grounding: integrating NLP into GANs for Visual QA
- Basic SLAM using monocular RGB camera on mobile phone

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, India **CGPA:** 8.44 / 10

Research Experience — **Research Fellow** — *Applied Research Lab* *May 2017 - August 2018*
International Institute of Information Technology (IIIT) - Hyderabad, India
Prof. C. V. Jawahar, Centre for Visual Information Technology, IIIT-Hyderabad

PROJECT: **Video Translation**
- Generated lip movements in movies and educational tutorials to match speech in other languages
- Short paper accepted at CVPR Workshop 2018 (FIVER), full paper submitted to ICASSP 2019

PROJECT: **Assessor for Lipreader**
- Built a visual speech recognizer (lipreader) to classify spoken words by combining CNNs and RNNs
- Built an assessor for self-training on unlabelled data, zero-shot learning on out-of-vocabulary words

Consultant, Computer Vision — *Playment (computer vision startup)* *January 2018 - June 2018*
- Worked on semantic segmentation models for autonomous driving

Mentor — *Foundations of Artificial Intelligence and Machine Learning* *January 2018 - May 2018*
IIIT Hyderabad, India — *six months certificate program for software professionals*
- Designed tutorials and lab sessions on artificial intelligence and machine learning, and mentored industry professionals.

Research Papers

[1] Abhishek Jha, Vikram Voleti, Vinay P. Namboodiri, C. V. Jawahar, "Lip-Synchronization for Dubbed Instructional Videos" in *CVPR Workshop*, 2018 (FIVER) [pdf, url]

[2] 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 [pdf]

[3] 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]

Thesis Projects — **"De-fencing of Images using RGB-D Data" — M.Tech. Thesis** *2013 - 2014*
IIT Kharagpur — *Prof. Rajiv Sahay, Department of Electrical Engineering*
- Elimination of fence-like occlusions, and inpainting of images using RGB-D data
- Nominated for Best M.Tech. Project Award among three departments (Electrical, Electronics, CS)
- Research paper [3] based on work is published in the proceedings of ICAPR 2015
- 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
- Links — GitHub repository containing thesis, presentation, code files, and results

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
- 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 [2] 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 aircrafts family
- Simulated signal-level modifications to the Flight Warning Computer, adopting standard avionics coding guidelines (DO-178B)

Research Internships

"Implementation of Carry-Free Arithmetic Operations in FPGA" *Summer 2013*
KU Leuven, Belgium — *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
- 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, used to recognize shapes drawn by fingertip
- 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
- 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, Ubuntu, Windows
Libraries: CUDA, IDS (cameras), Keras, LaTeX, OpenCV, PyTorch, Tensorflow

Scholastic Achievements

- Talk: "BigGAN - Large Scale GAN Training for High Fidelity Natural Image Synthesis" [presentation] — at Mila, University of Montréal, Canada
- Talk: "Image de-fencing using RGB-D data" [presentation] — at Max Planck Insitute for Informatics, Saarbrücken, Germany
- Talk: "Mathematics of back-propagation in multi-layer perceptrons" [link] — at GreyOrange Robotics, India, and at IIIT-Hyderabad
- Talk: "Intuition behind LSTMs" [presentation] — at IIIT Hyderabad, India
- 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
- Won the SMS Classification challenge, participated in the Video Action Recognition challenge in the 2017 Hack2Innovate hackathon in Bangalore, India
- Completed *additional* courses in Computer Science & Engineering at IIT Kharagpur
  - Algorithms-I, Artificial Intelligence, Computational Number Theory
- 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)