Vikram Voleti

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

Education

PhD student, with Prof. Christopher Pal *Fall 2018 - present*
Mila, University of Montreal, Canada

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 Papers

[1] Vincent Michalski, Vikram Voleti, Samira E. Kahou, Anthony Oritz, Pascal Vincent, Chris Pal, Doina Precup, "Comparing Normalization in Conditional Computation Tasks" in *ICML 2019 Workshop* [pdf]

[2] Abhishek Jha*, Vikram Voleti*, Vinay P. Namboodiri, C. V. Jawahar, "Cross-Language Speech Dependent Lip-Synchronization" in *ICASSP 2019* [pdf]

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

[4] 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]

[5] S. Jonna, V. S. Voleti, R. R. Sahay, and M. S. Kankanhalli, "A Multimodal Approach for Image De-fencing and Depth Inpainting," in *ICAPR*, 2015, pp. 1—6 [pdf, IEEE]

Current Projects

- Large-scale video prediction and generation using adversarial learning
- Visual reasoning via language grounding: integrating question-answering into GANs
- Other projects: deep generative models for 3D, conditional image generation [1]

Research Experience

Research Fellow — IIIT Hyderabad, India *May 2017 - Aug 2018*
Prof. C. V. Jawahar, Centre for Visual Information Technology, IIIT-Hyderabad

- Synthesized videos of educational tutorials in other languages by generating lips from audio
- Full paper published at ICASSP 2019 [2], short paper published at CVPR Workshop 2018 [3]
- Built a visual speech recognizer (lipreader) to classify spoken words
- Built an assessor for self-training on unlabelled data, zero-shot learning on out-of-vocabulary words

Other Experience

Scientist in Residence — NextAI (startup accelerator), Montreal, Canada *April 2019 - Aug 2019*

- Consultant for multiple startups on computer vision, deep learning and AI

Consultant, Computer Vision — Playment, Bengaluru, India *Jan 2018 - June 2018*

- Worked on semantic segmentation models for autonomous driving

Mentor, Foundations of AI & ML — TalentSprint, Hyderabad, India *Jan 2018 - May 2018*
Six months certificate program in collaboration with IIIT Hyderabad*, India*

- Designed and presented tutorials on machine learning, and mentored industry professionals

Thesis Projects

Masters thesis — "De-fencing of Images using RGB-D Data" *2013 - 2014*
IIT Kharagpur, India — *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 [5] based on work is published in the proceedings of ICAPR 2015
- Links — GitHub repository containing thesis, presentation, code files, and results

Bachelors thesis — "Identification of Bilabial Lip Closures in Audio and Video" *2012 - 2013*
IIT Kharagpur, India — *Prof. Rajiv Sahay, Department of Electrical Engineering*

- Measurement of synchronization between audio and video using bilabial cues in both modes
- Links — GitHub repository containing thesis, presentation, code files, and results

Talks & Other Achievements

- *May 2019* — Talk: Tutorial on GANs at the AI for Social Good Summer Lab, Montreal
- *January 2019* — Code: Released code for Self-Attention GAN in PyTorch, converting from TensorFlow code released by Google Brain [GitHub]
- *Oct 2018* — Talk: "BigGAN - Large Scale GAN Training for High Fidelity Natural Image Synthesis" [presentation] — at Mila, University of Montreal, Canada
- *Feb 2018* — Talk: "Image de-fencing using RGB-D data" [presentation] — at Max Planck Insitute for Informatics, Saarbrücken, Germany
- *Feb 2018* — Talk: "Intuition behind LSTMs" [presentation] — at IIIT Hyderabad, India
- *Aug 2017* — Talk: "Mathematics of back-propagation in multi-layer perceptrons" [link] — at GreyOrange Robotics, India, and 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
- Qualified JEE 2009 by IIT at 99.7 percentile, with All India Rank of 1330 (out of 384,977)

Work Experience

Image Processing Engineer — GreyOrange Robotics, Gurgaon, India *Feb 2016 - May 2017*

- Developed computer vision module to perform video processing in real time for warehouse automation
- Responsible for development and testing of entire code, including video processing module, module for communication with camera drivers, other systems, and server
- Research paper [4] based on work is published by ACM at ICIDE 2017

Associate Engineer — Airbus Group India, Bengaluru, India *July 2014 - Feb 2016*

- 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)

Past Research Internships

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

- Designed arithmetic operations using Carry-Free Logic, 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 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, UK — *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

Skills

C, C++, CUDA, HTML/CSS, Javascript, Keras, MATLAB, OpenCV, Python, PyTorch, Shell, Tensorflow