Vikram Voleti

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Website: voletiv.github.io *Google Scholar* *LinkedIn* *GitHub*

Education

Mila, University of Montreal, Canada — *Fall 2018 - present*
PhD in Computer Science — *Supervisor*: Prof. Christopher Pal

Indian Institute of Technology (IIT), Kharagpur, India — *2009 - 2014*
Dual Degree (B.Tech. (H) + M.Tech.) in Electrical Engineering
with Master's specialization in Instrumentation and Signal Processing — CGPA: 8.44 / 10

Research Papers

[1] K. M. Jatavallabhula, M. Macklin, F. Golemo, V. Voleti, L. Petrini, M. Weiss, B. Considine, J. Parent-Lévesque, K. Xie, K. Erleben, L. Paull, F. Shkurti, S. Fidler, D. Nowrouzezahrai, "Introducing GradSim: Differentiable Simulation for Self-Supervised Parameter Estimation from Video" - *MAIS 2020*

[2] S. Mittal, A. Lamb, A. Goyal, V. Voleti, M. Shanahan, G. Lajoie, M. Mozer, Y. Bengio, "Learning to Combine Top-Down and Bottom-Up Signals in Recurrent Neural Networks with Attention over Modules" - *ICML 2020* [arxiv]

[3] V. Voleti*, D. Kanaa*, S. E. Kahou, C. Pal, "Simple Video Generation using Neural ODEs" - *NeurIPS 2019 Workshop* [pdf]

[4] V. Michalski, V. Voleti, S. E. Kahou, A. Oritz, P. Vincent, C. Pal, D. Precup, "Comparing Normalization in Conditional Computation Tasks" - *ICML 2019 Workshop* [arxiv]

[5] V. Voleti*, A. Jha*, V. P. Namboodiri, C. V. Jawahar, "Cross-Language Speech Dependent Lip-Synchronization" - *ICASSP 2019* [pdf]

[6] V. Voleti*, A. Jha*, V. P. Namboodiri, C. V. Jawahar, "Lip-Synchronization for Dubbed Instructional Videos" - *CVPR 2018 Workshop* [pdf]

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

Research Experience

Research projects Multi-scale image generation using continuous normalizing flows; Self-supervised video prediction for autonomous driving using Neural ODEs; Neural rendering; Differentiable 3D simulation

University of Guelph, Canada — Visiting Researcher — *Dec 2019 - present*
- *Supervisor*: Prof. Graham Taylor

Google, Mountain View, USA — Research Intern — *Sep 2019 - Dec 2019*
- *Team*: Google AI Perception, *Supervisors*: Bryan Seybold, Sourish Chaudhuri
- Research on multimodal semi-supervised Active Speaker Detection in videos

IIIT Hyderabad, India — Research Fellow; *Supervisor*: Prof. C. V. Jawahar — *May 2017 - Aug 2018*
- Synthesized video in regional Indian languages by generating lips from audio
- Full paper published at ICASSP 2019 [5], short paper published at CVPR 2018 Workshop [6]

Other Experience

Reviewer — ICLR 2020, NeurIPS 2020, ICML 2020, CCAI @ ICLR 2020, ICLR 2020, CCAI @ NeurIPS 2019, LLD @ ICLR 2019

Blue Lion Labs, Canada — AI Advisor — *Oct 2020 - present*

GRAPHQUON (Graphics conference), Canada — Organizing committee member — *Oct 2020 - Dec 2020*

NextAI, Canada — AI Scientist in Residence — *Mar 2020 - Sep 2020; Apr 2019 - Sep 2019*

University of Montreal, Montreal, Canada — Teaching Assistant
- Fundamentals of Machine Learning (IFT 6390) by Ioannis Mitliagkas — *Fall 2020; Sep 2019*

IVADO/Mila Deep Learning School, Montreal, Canada — Teaching Assistant — *Sep 9-13, 2019*

Playment, Bengaluru, India — Computer Vision Consultant — *Jan 2018 - Jun 2018*
- Worked on semantic segmentation models for autonomous driving

TalentSprint, Hyderabad, India — Mentor, Foundations of AI & ML — *Jan 2018 - May 2018*
- Designed and presented tutorials on machine learning, and mentored industry professionals

Work Experience

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

- Developed computer vision module for video processing in real time for warehouse automation
- Research paper based on work is published by ACM at ICIDE 2017

Airbus, Bengaluru, India — Associate Engineer *Jul 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)

Talks & Other Efforts

- *Sep 2020* - "Continuous Normalizing Flows" — Mila, Canada [slides]
- *Jul 2020* - "GANs: the story so far" — Summer Symposium on AI Research, India [slides] [video]
- *Jul 2020* - "A brief tutorial on Neural ODEs" — Mila, Canada [slides] [video]
- *Apr 2020* - "Mathematics of Neural ODEs" — University of Guelph, Canada [slides]
- *Jan 2020* - "Simple Video Generation using Neural ODEs" — IIIT Hyderabad, India [slides]
- *May 2019* - Tutorial on "GANs" — AI for Social Good Summer Lab, Montreal
- *Jan 2019* - Released code for Self-Attention GAN in PyTorch, converting from TensorFlow code released by Google Brain [GitHub]
- *Oct 2018* - "BigGAN" — Mila, University of Montreal, Canada [slides]
- *Feb 2018* - "Image de-fencing using RGB-D data" — MPI Informatics, Saarbrücken, Germany [slides]
- *Feb 2018* - "Intuition behind LSTMs" at IIIT Hyderabad, India [slides]
- *Aug 2017* - "Mathematics of back-propagation in multi-layer perceptrons" — GreyOrange Robotics, India, and at IIIT-Hyderabad, India [slides]
- 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)

Thesis Projects

Supervisor: Prof. Rajiv Sahay, Electrical Engineering, IIT Kharagpur, India

Master's thesis — "De-fencing of Images using RGB-D Data" *2013 - 2014*

- 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 [7] based on work is published in the proceedings of ICAPR 2015

Bachelor's thesis — "Identification of Bilabial Lip Closures in Audio and Video" *2012 - 2013*

- Measurement of synchronization between audio and video using bilabial cues in both modes

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Past Research Internships

KU Leuven, Belgium — *Supervisor*: Prof. Ingrid Verbauwhede, ESAT *Summer 2013*

- Designed arithmetic operations using Carry-Free Logic, simulated circuits in Xilinx

IIT Kharagpur, India — *Supervisor*: Prof. Aurobinda Routray, Electrical Engineering *Summer 2012*

- Made a gesture recognition program in MATLAB using Hidden Markov Models

Imperial College, UK — *Supervisor*: Prof. Peter Cheung, Electrical & Electronics *Summer 2011*

- Measured the relative power consumption among the LookUp Tables (LUTs) of an FPGA

Skills

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