VIKRAM VOLETI

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

EDUCATION

Mila, University of Montreal, Canada   *Fall 2018 - present (anticipated 08/2023)*
PhD in Computer Science — *Supervisor*: Prof. Christopher Pal   (A) 4.0 / 4.3

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

RESEARCH EXPERIENCE

Research projects: Multi-resolution image generation using continuous normalizing flows [1]; Score-based generative models; Differentiable 3D simulation [4]; Self-supervised video prediction using Neural ODEs [6];

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

Google, Mountain View, USA — Research Intern   *Sep-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 educational videos in regional Indian languages by generating lips from audio
- Full paper published at ICASSP 2019 [7], short paper published at CVPR 2018 Workshop

OTHER EXPERIENCE

Reviewer — ICLR 2022, ACML 2021, NeurIPS 2021, ICCV 2021, CVPR 2021 (***Outstanding Reviewer***),
ICLR 2020, NeurIPS 2020, ICML 2020, NeurIPS 2019, workshops

Organizer — **ICCV 2021** - Differentiable 3D Vision and Graphics workshop   *Oct 2021*
OWCV 2021 (Canadian Computer Vision workshop), Canada   *Feb-Apr 2021*
GRAPHQUON 2020 (Canadian Computer Graphics workshop), Canada   *Oct-Dec 2020*

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

University of Montreal, Montreal, Canada — Teaching Assistant
- Fundamentals of Machine Learning (IFT 6390) by Prof. Ioannis Mitliagkas   *Sep-Dec 2020*

NextAI - Toronto, Canada — AI Scientist in Residence   *Mar-Sep 2020*

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

NextAI - Montreal, Canada — Scientist in Residence   *Apr-Sep 2019*

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

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

RESEARCH PAPERS (RECENT)

[1] "Multi-Resolution Continuous Normalizing Flows", <u>V. Voleti</u>, C. Finlay, A. Oberman, C. Pal - *Preprint* [arXiv]

[2] "FairCal : Fairness Calibration for Face Verification", T. Salvador, S. Cairns, <u>V. Voleti</u>, N. Marshall, A. Oberman - *Preprint* [arXiv]

[3] "Frustratingly Easy Uncertainty Estimation", T. Salvador, <u>V. Voleti</u>, A. Iannantuono, A. Oberman - *Preprint* [arXiv]

[4] "gradSim: Differentiable simulation for system identification and visuomotor control" , K. M. Jatavallabhula, M. Macklin, F. Golemo, <u>V. Voleti</u>, L. Petrini, M. Weiss, B. Considine, J. Parent-Lévesque, K. Xie, K. Erleben, L. Paull, F. Shkurti, D. Nowrouzezahrai, S. Fidler - *ICLR 2021* [arXiv] [OpenReview]

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

[6] "Simple Video Generation using Neural ODEs", <u>V. Voleti</u>*, D. Kanaa*, S. E. Kahou, C. Pal - *NeurIPS 2019 Workshop* [arXiv]

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

AWARDS, TALKS & OTHER EFFORTS	*Dec 2020* - Microsoft Diversity Award for Doctoral Research

- *May 2021* - Outstanding Reviewer at CVPR 2021
- *Apr 2021* - "Training GANs by Solving ODEs" — Mila, Canada [slides]
- *Feb 2021* - "Score-based Generative Models" — Mila, Canada [slides]
- *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]
- *Nov 2017* - Won the SMS Classification challenge, participated in the Video Action Recognition challenge in the 2017 Hack2Innovate hackathon in Bangalore, India
- *Aug 2017* - "Mathematics of back-propagation in multi-layer perceptrons" — GreyOrange Robotics, India, and at IIIT-Hyderabad, India [slides]
- *Jul 2017* - Attended summer schools on Computer Vision and Machine Learning at IIIT-Hyderabad
  - Stood 3$^{\text{rd}}$ in Computer Vision Summer School out of 120+ participants, rewarded full fee waiver
  - Stood 4$^{\text{th}}$ in Machine Learning Summer School out of 120+ participants, rewarded full fee waiver
- *Apr 2009* - Qualified JEE 2009 by IIT at 99.7 percentile, with All India Rank of 1330 (out of 384,977)

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)

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 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, Jax, Keras, MATLAB, OpenCV, Python, PyTorch, Tensorflow