

VIKRAM VOLETI

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EDUCATION	Mila, University of Montreal , Canada PhD in Computer Science — <i>Supervisor</i> : Prof. Christopher Pal	<i>Fall 2018 - present (anticipated Aug 2023)</i> (A) 4.0 / 4.3
	Indian Institute of Technology (IIT), Kharagpur , India Dual Degree (B.Tech. (H) + M.Tech.) in Electrical Engineering with Master's specialization in Instrumentation and Signal Processing	<i>2009 - 2014</i> 8.44 / 10
RESEARCH	Deep learning for image, video, 3D : Video Prediction/Generation with Score-based Diffusion models [1]; 3D human pose estimation and inverse kinematics [3]; Image generation with Continuous Normalizing flows [4]; Video prediction with Neural ODEs [10]; 3D object generation using radiance fields	
RESEARCH EXPERIENCE	Meta (formerly Facebook), Menlo Park, USA — Research Intern • <i>Team</i> : AI for Metaverse (AI4RL); <i>Supervisors</i> : Yashar Mehdad, Barlas Oguz • Research on denoising diffusion models for video and 3D object generation	<i>Aug-Dec 2022</i>
	Unity Technologies , Canada — MITACS Research Intern • <i>Team</i> : Deep Pose, Unity Labs; <i>Supervisor</i> : Boris Oreshkin • 3D human pose estimation and inverse kinematics from videos, published at SIGGRAPH Asia [3]	<i>Oct 2021 - Aug 2022</i>
	Google , Mountain View, USA — Research Intern • <i>Team</i> : Google AI Perception, <i>Supervisors</i> : Bryan Seybold, Sourish Chaudhuri • Research on multimodal semi-supervised Active Speaker Detection in videos	<i>Sep-Dec 2019</i>
	IIT Hyderabad , India — Research Fellow; <i>Supervisor</i> : Prof. C. V. Jawahar • Synthesized educational videos in regional Indian languages by generating lips from audio • Full paper published at ICASSP 2019 [11], short paper published at CVPR 2018 Workshop	<i>May 2017 - Aug 2018</i>
OTHER EXPERIENCE	Reviewer — CVPR 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 OWCV 2021 (Canadian Computer Vision workshop), Canada GRAPHQUON 2020 (Canadian Computer Graphics workshop), Canada	<i>Feb-Oct 2021</i> <i>Feb-Apr 2021</i> <i>Oct-Dec 2020</i>
	Blue Lion Labs , Canada — AI Advisor	<i>Oct 2020 - present</i>
	University of Montreal , Montreal, Canada — Teaching Assistant • Fundamentals of Machine Learning (IFT 6390) by Prof. Ioannis Mitliagkas	<i>Sep 2019, Sep-Dec 2020</i>
	NextAI - Toronto, Canada — AI Scientist in Residence • Consultant for multiple early-stage startups on machine learning and AI	<i>Mar-Sep 2020</i>
	IVADO/Mila Deep Learning School , Montreal, Canada — Teaching Assistant	<i>Sep 2019</i>
	NextAI - Montreal, Canada — Scientist in Residence (AI Consultant for early-stage startups)	<i>Apr-Sep 2019</i>
	Playment , Bengaluru, India — Computer Vision Consultant • Worked on semantic segmentation models for autonomous driving	<i>Jan-Jun 2018</i>
	TalentSprint , Hyderabad, India — Mentor, Foundations of AI & ML (inaugural program) • Designed and presented tutorials on machine learning, and mentored industry professionals	<i>Jan-May 2018</i>
RESEARCH PAPERS (SELECT)	<ol style="list-style-type: none">[1] “MCVD: Masked Conditional Video Diffusion for Prediction, Generation, and Interpolation”, V. Voleti, A. Jolicoeur-Martineau, C. Pal - <i>NeurIPS 2022</i> [arXiv][2] “Score-based Denoising Diffusion with Non-Isotropic Gaussian Noise Models”, V. Voleti, C. Pal, A. Oberman - <i>NeurIPS 2022 Workshop</i> [arXiv][3] “SMPL-IK: Learned Morphology-Aware Inverse Kinematics for AI Driven Artistic Workflows”, V. Voleti, B. N. Oreshkin, F. Bocquet, F. G. Harvey, L. Ménard, C. Pal - <i>SIGGRAPH Asia 2022</i> [arXiv][4] “Multi-Resolution Continuous Normalizing Flows”, V. Voleti, C. Finlay, A. Oberman, C. Pal - [arXiv][5] “FairCal : Fairness Calibration for Face Verification”, T. Salvador, S. Cairns, V. Voleti, N. Marshall, A. Oberman - <i>ICLR 2022</i> [arXiv][6] “Generative Models of Brain Dynamics”, M. Ramezani-Panahi, G. Abrevaya, JC. Gagnon-Audet, V. Voleti, I. Rish, G. Dumas - <i>Frontiers in Artificial Intelligence (journal)</i> [arXiv]	

- [7] “Improving Continuous Normalizing Flows using a Multi-Resolution Framework”, **V. Voleti**, C. Finlay, A. Oberman, C. Pal - *ICML 2021 Workshop*
- [8] “gradSim: Differentiable simulation for system identification and visuomotor control” , 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, D. Nowrouzezahrai, S. Fidler - *ICLR 2021* [[arXiv](#)]
- [9] “Learning to Combine Top-Down and Bottom-Up Signals in RNNs with Attention over Modules”, S. Mittal, A. Lamb, A. Goyal, **V. Voleti**, M. Shanahan, G. Lajoie, M. Mozer, Y. Bengio - *ICML 2020* [[arXiv](#)]
- [10] “Simple Video Generation using Neural ODEs”, **V. Voleti**, D. Kanaa, S. E. Kahou, C. Pal - *NeurIPS 2019 Workshop* [[arXiv](#)]
- [11] “Cross-Language Speech Dependent Lip-Synchronization”, **V. Voleti**, A. Jha, V. P. Namboodiri, C. V. Jawahar - *ICASSP 2019* [[pdf](#)]

AWARDS	Outstanding Reviewer at CVPR 2021	May 2021
	Microsoft Diversity Award for Doctoral Research, \$6,000	Dec 2020
	MITACS Accelerate Research Internship, \$30,000	Oct 2020
	University of Montreal entrance scholarship, \$37,000	Sep 2018
TALKS & OTHER EFFORTS	<ul style="list-style-type: none"> • “MVCD: Masked Conditional Video Diffusion” — NeurIPS 2022, New Orleans, USA [slides] 	Dec 2022
	<ul style="list-style-type: none"> • “SMPL-IK: Learned Morphology-Aware Inverse Kinematics for AI Driven Artistic Workflows” — SIGGRAPH Asia, Diagu, South Korea [slides] [video] 	Dec 2022
	<ul style="list-style-type: none"> • “Normalizing flows” — Learning Representations (course), University of Montreal, Canada 	Nov 2022
	<ul style="list-style-type: none"> • “Score-based Denoising Diffusion Models - a tutorial” — Mila, Canada [slides] 	Sep 2022
	<ul style="list-style-type: none"> • “Solving Video Tasks using Denoising Diffusion Models” — Samsung Toronto, Canada [slides] 	Aug 2022
	<ul style="list-style-type: none"> • “Denoising Diffusion GANs” — Mila, Canada [slides] 	Feb 2022
	<ul style="list-style-type: none"> • “Score-based Generative Models with SDEs” — Mila, Canada [slides] 	Feb 2021
	<ul style="list-style-type: none"> • “Continuous Normalizing Flows” — Mila, Canada [slides] 	Sep 2020
	<ul style="list-style-type: none"> • “GANs: the story so far” — Summer Symposium on AI Research, India [slides] [video] 	Jul 2020
	<ul style="list-style-type: none"> • “A brief tutorial on Neural ODEs” — Mila, Canada [slides] [video] 	Jul 2020
	<ul style="list-style-type: none"> • “Mathematics of Neural ODEs” — University of Guelph, Canada [slides] 	Apr 2020
	<ul style="list-style-type: none"> • “Simple Video Generation using Neural ODEs” — IIIT Hyderabad, India [slides] 	Jan 2020
	<ul style="list-style-type: none"> • Tutorial on “GANs” — AI for Social Good Summer Lab, Montreal 	May 2019
	<ul style="list-style-type: none"> • “Image de-fencing using RGB-D data” — MPI Informatics, Saarbrücken, Germany [slides] 	Feb 2018
	<ul style="list-style-type: none"> • “Intuition behind LSTMs” at IIIT Hyderabad, India [slides] 	Feb 2018
	<ul style="list-style-type: none"> • “Mathematics of back-propagation” — GreyOrange Robotics, and IIIT-Hyderabad, India [slides] 	Aug 2017
	<ul style="list-style-type: none"> • Attended summer schools on Computer Vision and Machine Learning at IIIT-Hyderabad 	Jul 2017
	<ul style="list-style-type: none"> – Rewarded full fee waiver, stood 3rd and 4th in respective schools out of 120+ participants 	
	<ul style="list-style-type: none"> • Qualified JEE 2009 by IIT at 99.7 percentile, with All India Rank of 1330 (out of 384,977) 	Apr 2009
WORK EXPERIENCE	GreyOrange Robotics , Gurgaon, India — Image Processing Engineer	Feb 2016 - May 2017
	<ul style="list-style-type: none"> • Developed computer vision module for video processing in real time for warehouse automation 	
	Airbus , Bengaluru, India — Associate Engineer	Jul 2014 - Feb 2016
	<ul style="list-style-type: none"> • Avionics software development and integration following standard avionics coding guidelines (DO-178B) 	
THESIS PROJECTS	<i>Supervisor</i> : Prof. Rajiv Sahay, Electrical Engineering, IIT Kharagpur, India	
	Master’s thesis — “De-fencing of Images using RGB-D Data”	2013 - 2014
	<ul style="list-style-type: none"> • Elimination of fence-like occlusions, and inpainting of images using RGB-D data 	
	<ul style="list-style-type: none"> • Nominated for Best Project Award among three departments, research work published at ICAPR 2015 	
	Bachelor’s thesis — “Identification of Bilabial Lip Closures in Audio and Video”	2012 - 2013
	<ul style="list-style-type: none"> • Measurement of synchronization between audio and video using bilabial cues in both modes 	
PAST RESEARCH INTERNSHIPS	KU Leuven , Belgium — <i>Supervisor</i> : Prof. Ingrid Verbauwhede, ESAT	Summer 2013
	<ul style="list-style-type: none"> • Designed arithmetic operations using Carry-Free Logic, simulated circuits in Xilinx 	
	IIT Kharagpur , India — <i>Supervisor</i> : Prof. Aurobinda Routray, Electrical Engineering	Summer 2012
	<ul style="list-style-type: none"> • Made a gesture recognition program in MATLAB using Hidden Markov Models 	
	Imperial College , UK — <i>Supervisor</i> : Prof. Peter Cheung, Electrical & Electronics	Summer 2011
	<ul style="list-style-type: none"> • 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	