Vikram Voleti PhD candidate at Mila; former Research Intern at Google, Wunity, Meta; 4+ years of work experience woletiv.github.io □ vikram.voleti@gmail.com 7 Google Scholar in LinkedIn Research Deep learning for image, video, 3D: led multiple projects; experienced in collaborating with international partners in industry and academia; expert at machine learning research and development. Projects: Video prediction using Score-based Diffusion models [1], Neural ODEs [14]; 3D human pose estimation and inverse kinematics [3]; Image generation with Normalizing flows [4], neural radiance fields, GANs [16], etc. Mila, University of Montreal, Canada EDUCATION Fall 2018 - present (09/23) 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 Meta (formerly Facebook), Menlo Park, USA Research Aug-Dec 2022 Internships Team: AI for Metaverse (AI4RL); Supervisors: Dr. Yashar Mehdad, Dr. Barlas Oguz • Research on denoising diffusion models for video and 3D object generation DURING PHD • Leading project in collaboration with international teams, applying research to virtual reality product Unity Technologies, Montreal, Canada (MITACS Research Intern) Oct 2021 - Aug 2022 Team: Deep Pose, Unity Labs; Supervisor: Dr. Boris Oreshkin • 3D human pose estimation and inverse kinematics from videos, published at SIGGRAPH Asia [3] Led project on AI-assisted animation workflows, contributed to product pipeline with code, demos

Google, Mountain View, USA

Sep-Dec 2019

Team: Google AI Perception; Supervisors: Dr. Bryan Seybold, Dr. Sourish Chaudhuri

• Research on multimodal semi-supervised Active Speaker Detection in videos

Work

IIIT Hyderabad, India — Research Fellow; Supervisor: Prof. C. V. Jawahar

May 2017 - Aug 2018

EXPERIENCE

- Synthesized educational videos in regional Indian languages by generating lips from audio
- Developed automated pipeline to create large-scale audio-video dataset
- Full paper published at ICASSP 2019 [16], short paper published at CVPR 2018 Workshop

GreyOrange Robotics, Gurgaon, India — Image Processing Engineer

Feb 2016 - May 2017

- Developed embedded vision module for video processing in real time for warehouse automation
- Solely responsible for development and testing of code, video processing module, camera drivers, server

Airbus, Bengaluru, India — Associate Engineer

Jul 2014 - Feb 2016

- Avionics software development and integration following standard avionics coding guidelines (DO-178B)
- Simulated signal-level modifications to the Flight Warning Computer, contributed to the full coding V-cycle

OTHER

Blue Lion Labs, Canada — AI Advisor

Oct 2020 - present

Professional

• Provide technical guidance and mentorship to startup on the design and development of AI/ML systems

EXPERIENCE NextAI - Toronto, Canada — AI Scientist-in-Residence

Mar-Sep 2020

• Provided scientific and technical support to start-ups selected in yearly co-hort of NextAI accelerator

IVADO/Mila Deep Learning School, Montreal, Canada — Teaching Assistant

Sep 2019

NextAI - Montreal, Canada — Scientist-in-Residence

Apr-Sep 2019 • Provided scientific and technical support to start-ups selected in yearly co-hort of NextAI accelerator

Playment, Bengaluru, India — Computer Vision Consultant

Jan-Jun 2018

• Provided technical guidance to early-stage startup on semantic segmentation models for autonomous driving

TalentSprint, Hyderabad, India — Mentor, Foundations of AI & ML (inaugural program) Jan-May 2018

Designed and delivered tutorials on machine learning, and provided mentorship to industry professionals

AWARDS

Outstanding Reviewer at CVPR 2021 May 2021 Microsoft Diversity Award for Doctoral Research, \$6,000 Dec 2020 Oct 2020 MITACS Accelerate Research Internship, \$30,000 University of Montreal entrance scholarship, \$37,000 Sep 2018 IIIT Hyderabad merit scholarship for summer school, \$1,000 Jul 2017

VIKRAM VOLETI Page 1 of 3

Q	ERV	710	di.
O	ERI	/ 10	JΕ

Organizer — ICCV 2021 - Differentiable 3D Vision and Graphics workshop

OWCV 2021 (Canadian Computer Vision workshop), Canada

GRAPHQUON 2020 (Canadian Computer Graphics workshop), Canada

Oct-Dec 2020

Reviewer — Journal on Computer Vision and Image Understanding, CVPR 2022, ACML 2021, NeurIPS 2021, ICCV 2021, CVPR 2021 (*Outstanding Reviewer*), ICLR 2020, NeurIPS 2020, ICML 2020, NeurIPS 2019, CCAI @ ICLR 2020, CCAI @ NeurIPS 2019, LLD @ ICLR 2019

Past Research KU Leuven, Belgium — Supervisor: Prof. Ingrid Verbauwhede, ESAT

Summer~2013

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

INTERNSHIPS 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

RESEARCH PAPERS (SELECT)

- [1] "MCVD: Masked Conditional Video Diffusion for Prediction, Generation, and Interpolation", **V. Voleti**, A. Jolicoeur-Martineau, C. Pal NeurIPS 2022 [arXiv]
- [2] "Score-based Denoising Diffusion with Non-Isotropic Gaussian Noise Models", **V. Voleti**, C. Pal, A. Oberman NeurIPS 2022 Workshop [arXiv]
- [3] "SMPL-IK: Learned Morphology-Aware Inverse Kinematics for AI Driven Artistic Workflows", **V. Voleti**, B. N. Oreshkin, F. Bocquelet, F. G. Harvey, L. Ménard, C. Pal SIGGRAPH Asia 2022 [arXiv]
- [4] "Multi-Resolution Continuous Normalizing Flows", V. Voleti, C. Finlay, A. Oberman, C. Pal Submitted to a journal [arXiv]
- [5] "FairCal: Fairness Calibration for Face Verification", T. Salvador, S. Cairns, **V. Voleti**, N. Marshall, A. Oberman *ICLR 2022* [arXiv]
- [6] "Plankton-FL: Exploration of Federated Learning for Privacy-Preserving Training of Deep Neural Networks for Phytoplankton Classification", D. Zhang, V. Voleti, A. Wong, J. Deglint CVIS 2022 (Oral)
- [7] "Generative Models of Brain Dynamics", M. Ramezanian-Panahi, G. Abrevaya, JC. Gagnon-Audet, V. Voleti, I. Rish, G. Dumas Frontiers in Artificial Intelligence (journal) [arXiv]
- [8] "Towards Generating Large Synthetic Phytoplankton Datasets for Efficient Monitoring of Harmful Algal Blooms", N. Bamra, V. Voleti, A. Wong, J. Deglint FSS at AAAI 2022 [arXiv]
- [9] "Improving Continuous Normalizing Flows using a Multi-Resolution Framework", **V. Voleti**, C. Finlay, A. Oberman, C. Pal *ICML 2021 Workshop*
- [10] "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]
- [11] "Accounting for Variance in Machine Learning Benchmarks", X. Bouthillier, P. Delaunay, M. Bronzi, A. Trofimov, B. Nichyporuk, J. Szeto, N. Sepah, E. Raff, K. Madan, V. Voleti, S. E. Kahou, V. Michalski, D. Serdyuk, T. Arbel, C. Pal, G. Varoquaux, P. Vincent MLSys 2021 [arXiv]
- [12] "Frustratingly Easy Uncertainty Estimation for Distribution Shift", T. Salvador, V. Voleti, A. Iannantuono, A. Oberman Preprint [arXiv]
- [13] "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]
- [14] "Simple Video Generation using Neural ODEs", V. Voleti, D. Kanaa, S. E. Kahou, C. Pal NeurIPS 2019 Workshop [arXiv]
- [15] "Comparing Normalization in Conditional Computation Tasks", V. Michalski, V. Voleti, S. E. Kahou, A. Oritz, P. Vincent, C. Pal, D. Precup *ICML 2019 Workshop* [arXiv]
- [16] "Cross-Language Speech Dependent Lip-Synchronization", **V. Voleti**, A. Jha, V. P. Namboodiri, C. V. Jawahar *ICASSP 2019* [pdf]
- [17] "Lip-Synchronization for Dubbed Instructional Videos", **V. Voleti**, A. Jha, V. P. Namboodiri, C. V. Jawahar *CVPR 2018 Workshop* (FIVER) [pdf]
- [18] "A Multimodal Approach for Image De-fencing and Depth Inpainting", S. Jonna, V. Voleti, R. R. Sahay, and M. S. Kankanhalli *ICAPR* 2015 [pdf, IEEE]

VIKRAM VOLETI Page 2 of 3

Talks	• "MVCD: Masked Conditional Video Diffusion" — NeurIPS 2022, New Orleans, USA [slides]	Dec 2022		
	 "SMPL-IK: Learned Morphology-Aware Inverse Kinematics for AI Driven Artistic Workflow — SIGGRAPH Asia, Diagu, South Korea [slides, video] 	s" Dec 2022		
	• "Normalizing flows" — Learning Representations (course), University of Montreal, Canada	Nov 2022		
	• "Score-based Denoising Diffusion Models - a tutorial" — Mila, Canada [slides, video]	Sep 2022		
	• "Solving Video Tasks using Denoising Diffusion Models" — Samsung Toronto, Canada [slide	as] Aug 2022		
	• "MVCD: Masked Conditional Video Diffusion" — Mila, Canada	$May\ 2022$		
	• "Denoising Diffusion GANs" — Mila, Canada [slides]	Feb 2022		
	• "Training GANs by Solving ODEs" — Mila, Canada [slides]	Apr~2021		
	• "Score-based Generative Models with SDEs" — Mila, Canada [slides]	Feb 2021		
	• "Continuous Normalizing Flows" — Mila, Canada [slides]	Sep~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]	Jul~2020		
	• "Mathematics of Neural ODEs" — University of Guelph, Canada [slides]	Apr~2020		
	• "Simple Video Generation using Neural ODEs" — IIIT Hyderabad, India [slides]	Jan~2020		
	• Tutorial on "GANs" — AI for Social Good Summer Lab, Montreal	$May\ 2019$		
	• "BigGAN" — Mila, University of Montreal, Canada [slides]	Oct 2018		
	• "Image de-fencing using RGB-D data" — MPI Informatics, Saarbrücken, Germany [slides]	Feb 2018		
	• "Intuition behind LSTMs" — IIIT Hyderabad, India [slides]	Feb 2018		
	• Tutorial on "Back-propagation" — IIIT-Hyderabad, India [slides]	Aug 2017		
	• "Mathematics of back-propagation" — GreyOrange Robotics, India [slides]	Feb 2017		
SKILLS	C/C++, CUDA, HTML/CSS, Javascript, Jax, Keras, IATEX, MATLAB, OpenCV, OS X, Python, PyTorch, Eshell, SLURM, Tensorflow, Ubuntu, Verilog, Windows			
TEACHING	University of Montreal, Montreal, Canada — Guest Lecturer	Nov 2020		
EXPERIENCE	• Representation Learning (IFT 6135) by Prof. Aishwarya Agrawal			
	University of Montreal, Montreal, Canada — Teaching Assistant	Sep-Dec 2020		
	• Fundamentals of Machine Learning (IFT 6390) by Prof. Ioannis Mitliagkas	Sep-Dec 2020		
	Summer Symposium on AI Research, India — Guest Speaker	Jul 2020		
	University of Montreal, Montreal, Canada — Teaching Assistant	Sep 2019		
	• Fundamentals of Machine Learning (IFT 6390) by Prof. Ioannis Mitliagkas			
	IVADO/Mila Deep Learning School, Montreal, Canada — Teaching Assistant	Sep 2019		
	AI for Social Good Summer Lab, Montreal, Canada — Lecturer	May 2019		
	 TalentSprint, Hyderabad, India — Mentor, Foundations of AI & ML (inaugural program) Designed and presented tutorials on machine learning, and mentored industry professional 	Jan-May 2018		
Thesis	Supervisor: Prof. Rajiv Sahay, Electrical Engineering, IIT Kharagpur, India			
Projects	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 Project Award among three departments, research work published at ICAPR 2015 			

 ${\bf Bachelor's\ thesis}-\hbox{``Identification\ of\ Bilabial\ Lip\ Closures\ in\ Audio\ and\ Video''}$

2012 - 2013

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

VIKRAM VOLETI Page 3 of 3