Mikaela Angelina Uy

Gates Computer Science, Rm 239

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https://mikacuy.github.io

Education	**Stanford University**	**CA, USA**
	Ph.D. Candidate in Computer Science	Sept 2019 – present
	Advisor: Prof. Leonidas Guibas	

	National University of Singapore	**Singapore**
	Master of Computing (Computer Science); CAP: 4.58/5.0	2017 – 2018
	Scholarship: NUS Graduate Scholarship for ASEAN Nationals (full masters scholarship)	

	Hong Kong University of Science and Technology	**Hong Kong**
	BSc. in Mathematics and Computer Science	2013 – 2017
	CGA: 3.84/4.3; CS CGA: 4.16/4.3; First Class Honors	
	Scholarship: HKSAR Government Targeted Scholarship (full 4-year university scholarship)	

Research Interests

My research interests are in 3D vision, graphics and machine learning, specifically on learning different representations of 3D objects and scenes for various downstream tasks such as deformation, reconstruction and controllable generation/variation synthesis. I am particularly drawn to designing methods that connect classical techniques to learning-based approaches that are fundamentally-grounded and mathematically-inspired.

Selected Publications

NeRF Revisited: Fixing Quadrature Instability in Volume Rendering
Mikaela Angelina Uy, George Kiyohiro Nakayama, Guandao Yang, Leonidas Guibas, Ke Li
Advances on Neural Information Processing Systems (**NeurIPS**) 2023

DiffFacto: Controllable Part-Based 3D Point Cloud Generation with Cross Diffusion
George Kiyohiro Nakayama, **Mikaela Angelina Uy**, Jiahui Huang, Shi-Min Hu, Ke Li, Leonidas Guibas
International Conference of Computer Vision (**ICCV**), 2023
Website: https://difffacto.github.io

OptCtrlPoints: Optimizing Control Points for Biharmonic 3D Shape Deformation
Kunho Kim[*], **Mikaela Angelina Uy**[*], Despoina Paschalidou, Alec Jacobson, Leonidas Guibas, Minhyuk Sung ([*]denotes equal contribution)
Pacific Graphics (**PG**) 2023 (Full Paper)
Website: https://soulmates2.github.io/publications/OptCtrlPoints/

SCADE: NeRFs from Space Carving with Ambiguity-Aware Depth Estimates
Mikaela Angelina Uy, Ricardo Martin-Brualla, Leonidas Guibas, Ke Li
Computer Vision and Pattern Recognition (**CVPR**), 2023.
Website: https://scade-spacecarving-nerfs.github.io

PartNeRF: Generating Part-Aware Editable 3D Shapes without 3D Supervision
Konstantinos Tertikas, Despoina Paschalidou, Boxiao Pan, Jeong Joon Park, **Mikaela Angelina Uy**, Ioannis Emiris, Yannis Avrithis, Leonidas Guibas
Computer Vision and Pattern Recognition (**CVPR**), 2023.

Point2Cyl: Reverse Engineering 3D Objects from Point Clouds to Extrusion Cylinders
Mikaela Angelina Uy[*], Yen-yu Chang[*], Minhyuk Sung, Purvi Goel, Joseph Lambourne, Tolga Birdal, Leonidas Guibas ([*]denotes equal contribution)
Computer Vision and Pattern Recognition (**CVPR**), 2022.
Website: https://point2cyl.github.io

Joint Learning of 3D Shape Retrieval and Deformation
Mikaela Angelina Uy, Vladimir G. Kim, Minhyuk Sung, Noam Aigerman, Siddhartha Chaudhuri, Leonidas Guibas
Computer Vision and Pattern Recognition (**CVPR**), 2021.
Website: https://joint-retrieval-deformation.github.io

Deformation-Aware 3D Shape Embedding and Retrieval
Mikaela Angelina Uy, Jingwei Huang, Minhyuk Sung, Tolga Birdal, Leonidas Guibas
European Conference on Computer Vision (**ECCV**), 2020.
Website: https://deformscan2cad.github.io

LCD: Learned Cross-Domain Descriptors for 2D-3D Matching
Quang-Hieu Pham, **Mikaela Angelina Uy**, Binh-Son Hua, Duc Thanh Nguyen, Sai-Kit Yeung
AAAI Conference on Artificial Intelligence (**AAAI**), 2020. **Oral**
Website: https://hkust-vgd.github.io/lcd/

Revisiting Point Cloud Classification: A New Benchmark Dataset and Classification Model on Real-World Data
Mikaela Angelina Uy, Quang-Hieu Pham, Binh-Son Hua, Duc Thanh Nguyen, Sai-Kit Yeung
International Conference of Computer Vision (**ICCV**), 2019. **Oral**
Website: https://hkust-vgd.github.io/scanobjectnn/

Work Experiences	**Google**	**Seattle, USA**
	Research Intern	Jun 2023-present

- Unconstrained dynamic NeRF reconstruction with uncertainty-aware motion field estimates
- Mentors: Ke Li, Xuan Luo, Zhengqi Li

Google   **Mountain View, USA**
Research Intern   Jun 2022-Jan 2023

- Sparse, unconstrained NeRF reconstruction with ambiguity-aware depth estimates
- Mentors: Ke Li, Mirko Visontai

Autodesk AI Lab   **San Francisco, USA (Remote)**
Research Intern   Jun 2021-Sept 2021

- Learning and understanding of 3D CAD and solid models
- Mentors: Joseph Lambourne

Adobe Research   **Seattle, USA (Remote)**
Research Intern   Jun 2020-Sept 2020

- 3D shape deformation techniques and parametric model understanding
- Mentors: Vladimir G. Kim, Minhyuk Sung, Noam Aigerman, Siddhartha Chaudhuri

Hong Kong University of Science and Technology   **Hong Kong**
Research Assistant   Sept 2018-Jun 2019

- 3D scene understanding and point cloud learning using deep learning techniques
- Supervisor: Prof. Sai-Kit Yeung

Invited Talks   **Apple Machine Learning Research (MLR)**   September 6, 2023
Towards Controllable 3D Content Creation by Leveraging Geometric Priors

	Google	July 12, 2023
	NeRF Revisited: Fixing Quadrature Instability in Volume Rendering	
	SFU Visual Computing and Robotics (VCR) Seminar	June 26, 2023
	Towards Controllable 3D Content Creation by Leveraging Geometric Priors	
	Structural and Compositional Learning on 3D Data CVPR Workshop	June 18, 2023
	Towards Controllable 3D Content Creation by Leveraging Geometric Priors	
	KAIST	January 9, 2023
	SCADE: NeRFs from Space Carving with Ambiguity-Aware Depth Estimates	
	VinAI Seminar Series	July 22, 2022
	Learning to Vary 3D Models for Universally Accessible 3D Content Creation	
	Brown Vision Computing Seminar	April 11, 2022
	Learning to Vary 3D Models for Universally Accessible 3D Content Creation	
	Stanford G-Cafe	March 10, 2022
	Point2Cyl: Reverse Engineering 3D Objects from Point Clouds to Extrusion Cylinders	
Teaching Experiences	**Stanford CS 348n Guest Lecture**	May 31, 2023
	Neural Radiance Fields: Sparse View and Dynamic Scenes	
	Stanford CS 348n Guest Lecture	May 24, 2023
	Continuous and Discrete Shape Edits/Deformation	
	Stanford CS 348n Guest Lecture	February 16, 2022
	Neural Shape Variation and Generation	
	Computer Graphics: Geometric Modeling/Processing (CS 348a)	Winter 2021
	Teaching Assistant, Stanford	
	• Taught recitation class once a week, held office hours twice a week, and graded all exams, homeworks and projects in the class.	
	Introduction to Computer Science (COMP 1021)	**Hong Kong**
	Lab Assistant, HKUST	Sept–Dec 2014
	• Taught in lab sessions of the introductory class in Python.	
Selected Awards	**EECS Rising Stars 2023**	2023
	Apple AI/ML PhD Research Fellowship	2023
	Snap Research Fellowship	2022
	Meta PhD Fellowship Finalist	2023
	School of Engineering Fellowship, *Stanford University*	2019-2020
	HKSAR Government Targeted Scholarship	2013-2017
	NUS Graduate Scholarship for ASEAN Nationals	2017-2018
	Epsilon Fund Award, *HKUST Mathematics Department*	2017
	Google Women Techmakers Scholarship; *Asia Pacific*	2016
	International Mathematical Olympiad (IMO) Bronze Medalist	2012, 2013

	Philippine Mathematical Olympiad 1st runner-up	2012, 2013

Services   **Reviewer:** CVPR, ICCV, ECCV, SIGGRAPH, SIGGRAPH Asia, BMVC, 3DV, AAAI, TVCG, Eurographics, Neurips, ICLR

Volunteer Competitive Math Trainor
Trained the PH IMO Team '17-'20; PH team leader for various elementary Math Olympiads

Projects   **Interpretable & Actionable Models using Attribute &**   Autumn 2019
Uncertainty Information
- CS229 (Machine Learning) course project
- Deep-learning models can be difficult to understand and control intuitively due to the black-box nature of these models. However, such lack of interpretability and human actionability in the models' decision processes make it difficult to trust these models in critical applications. We propose to alleviate these problems using attribute and uncertainty modeling.

Bachelor's Thesis (Underwater Robotics Vision)   2016 – 2017
- Advised by Prof. Chi-Keung Tang
- Studied the performance of real-time object detection models, both using handcrafted features and deep learning networks, for underwater diver detection in robotics applications.

HKUST Robotics Team, Remotely Operated Vehicle (ROV) Sub team
Software Engineer   2014 – 2015
- **Overall 3rd Place** (Explorer Class) – 14th Annual MATE International Underwater Robotics Competition in *St John's, Newfoundland and Labrador, Canada*
- **Asia Champion** in 2015 MATE Asia Regional Underwater Robotics Competition
- Built the main control software of the ROV and Qt GUI's for the competition runs.
- The team was composed of 15 engineers who built and designed the ROV from scratch.

Technical   Python, C/C++, Unix, Tensorflow, Pytorch, MATLAB, OpenCV,
Skills   ROS, microcontroller programming

Languages   **Native**: English, Filipino; **Proficient**: Mandarin