

Nilesh Kulkarni

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EDUCATION	<u>University of Michigan</u> , Ann Arbor, USA Ph.D. in Computer Science, EECS • Advisors: David Fouhey, Justin Johnson <u>Carnegie Mellon University</u> , Pittsburgh, USA Masters in Robotics, Robotics Institute, School of Computer Science • CGPA: 4.05/4.0 • Advisor: Abhinav Gupta <u>Indian Institute of Technology Bombay</u> , Mumbai, India Bachelor of Technology (B.Tech), Computer Science and Engineering with Honours • CGPA: 8.77/10 • Minor in Electrical Engineering • Advisor: Suyash Awate, Ganesh Ramakrishnan	Sept. 2019 - Aug. 2017 - Aug. 2019 Jul. 2011 - Jul. 2015
INTERESTS	My research interests are to understand and learn the 3D structure in the visual world with minimal supervision from images, and raw data. Topics: <i>Computer Vision</i> , <i>Machine Learning</i>	

PUBLICATIONS	Collision Replay: What does bumping into things tell you about the scene geometry? Alexander Raistrick, Nilesh Kulkarni , David Fouhey BMVC, 2021 (Oral) Implicit mesh reconstruction from unannotated image collections Shubham Tulsiani, Nilesh Kulkarni , Abhinav Gupta Preprint, 2021 Articulation-Aware Canonical Surface Mapping Nilesh Kulkarni , Abhinav Gupta, David Fouhey, Shubham Tulsiani CVPR, 2020 Canonical Surface Mapping via Geometric Cycle Consistency Nilesh Kulkarni , Abhinav Gupta*, Shubham Tulsiani* ICCV, 2019 3D-RelNet: Joint Object and Relational Network for 3D Prediction Nilesh Kulkarni , Ishan Misra, Shubham Tulsiani, Abhinav Gupta ICCV, 2019 On-Device Neural Language Model based Word Prediction Seunghak Yu*, Nilesh Kulkarni *, Haejun Lee, Jihie Kim 27th International Conference on Computational Linguistics: System Demonstrations (COLING 2018) Syllable-level Neural Language Model for Agglutinative Language Seunghak Yu*, Nilesh Kulkarni *, Haejun Lee, Jihie Kim Empirical Methods in Natural Language Processing, Workshop on Subword and Character Level Models, (EMNLP 2017) Robust Kernel Principal Nested Spheres Suyash Awate*, Manik Dhar*, Nilesh Kulkarni * 23rd International Conference on Pattern Recognition (ICPR 2016) Research and Development of Matsya 4.0, Autonomous Underwater Vehicle Technical Report, International Robosub Competition, 2015 * – Shared Authorship
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ACHIEVEMENTS	<ul style="list-style-type: none">• Secured an All India Rank 77 in IITJEE-2011 (amongst 0.5 million students)• Certified as among the Top 1% in India, in the Indian National Chemistry Olympiad and Indian National Physics Olympiad, 2011• Awarded Institute Technical Color (7 among 9000), 2014• Awarded Institute Technical Special Mention (15 among 9000), 2013• Awarded the Tata Welfare Trust Scholarship for Graduate Studies, 2017
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PROFESSIONAL SERVICE Reviewer 3DV 2019, CVPR 2020, ECCV 2020, NeurIPS 2020,

PROFESSIONAL EXPERIENCE	Samsung Research, Seoul, South Korea	Sept. 2015 - Jun. 2017
	Research Engineer, AI Lab	Jihie Kim
	Samsung Research, Seoul, South Korea	May 2014 - Jul. 2014
	Research Intern, AI Lab	Choonoh Lee
	Technical University of Braunschweig, Braunschweig, Germany	May 2013 - Jul. 2013
	Research Intern, Algorithms Group	Sándor P. Fekete

RESEARCH PROJECTS	Articulation Canonical Surface Mapping	Jun. 2019 - Dec 2019
	Research Assistant, University of Michigan	Advisor: David Fouhey
	• Designing a method to recover shape and pose without keypoint supervision	
	• Uses the structure of template category shape to get the articulated versions of the template shape	
	Canonical Surface Mapping	Oct. 2018 - Mar 2019
	Research Assistant, Robotics Institute	Advisor: Abhinav Gupta
	• Designing a method to perform correspondence matching without keypoint or multi-view supervision	
	• Uses the structure of mean category shape to map pixels in the image to mean-shape in 3D	
	3DRelNet, Joint Object and Relationship Network for 3D	Mar. 2018 - Sept 2018
	Research Assistant, Robotics Institute	Advisor: Abhinav Gupta
	• Improved 3D Reconstruction given a single image of the scene on standard metrics by 6 mAP points on the SUNCG dataset and by 3 mAP points on the NYUv2 dataset	
	• Designed a method to incorporate inductive biases set in indoor-scenes.	
	Conversational Modelling, Customer Care Assistant	Dec. 2016 - Jun. 2017
	Samsung Research, Seoul, South Korea	
	• Designed a siamese network with multi-objective cost to improve classification for in-domain data along increasing robustness to out-of-domain data	
• Researched on various deep learning conversational models to improve conversation contexts		
Natural Language Modelling, Smart Input Panel	Mar. 2016 - Nov. 2017	
Samsung Research, Seoul, South Korea		
• Designed language models for English and Korean using Recurrent Neural Nets (RNNs)		
• Optimized the model for memory and inference time constraints on mobile devices		
• Obtained better on-device keyboard predictions benchmarks than existing solutions and was rolled out to millions of users and deployed on all Samsung smart phones	paper1 paper2	
Distributed Linear Programming Boost (LPBoost)	Jul. 2014 - May 2015	
Undergraduate Dissertation, IIT Bombay	Advisor: Ganesh Ramakrishnan	
• Designed a distributed LP Boost (D-LPBoost) algorithm		
• Implemented the algorithm using two paradigms: data and hypothesis space parallelism		
• Formulated a master-slave solution with each slave working on a subset of hypotheses.	report code	
Kernel Principal Nested Sphere (KPNS)	Jul. 2014 - May 2015	
Undergraduate Research Project, IIT Bombay	Advisor: Suyash Awate	
• Designed KPNS, a kernel space statistical procedure		
• KPNS transforms data to independent un-correlated modes of variation called Principal Spheres		
• Achieved better results on downstream tasks of model-compactness, dimensionality reduction, classification	paper	
Online Triangulation using a Swarm of simple Robots	May 2013 - Jun. 2013	
Research Intern, Technical University of Braunschweig	Advisor: Sándor P. Fekete	
• Improved algorithms for exploring unknown areas using a swarm of simple robots		
• Minimized overall error in navigation and localization, allowing for complicated maneuvers		
Matsya, a Autonomous Underwater Vehicle(AUV)	Jun. 2012 - Jul. 2015	
IIT Bombay & Naval Research Board, India	Advisor: Leena Vachhani	

- Developed an Autonomous Underwater Vehicle to compete at International Robosub
- Team Leader - 2014: Led a 40 member team across three sub-divisions: Electronics, Software & Mechanical
- Software Leader - 2013: Led a sub-division of 5 members, to ensure full-stack software development for the AUV
- Three time semi-finalist at Robosub - 2013, 2014, 2015

[paper website](#)

TEACHING
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MENTORING

- Teaching Assistant CS 210 Logic Design, IIT Bombay
 - Teaching Assistant Workshop on Parallel Programming conducted by NVIDIA at IIT Bombay
 - Technical Mentor mentored 4 teams on technical projects
 - Department Academic Mentor mentored 9 sophomores
 - Electronics Club Coordinator club catering to hobby electronics at IIT Bombay
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SALIENT
COURSES

- **CMU**: Introduction to Machine Learning (10701), Visual Learning and Recognition (16824), Computer Vision (16720), Math Fundamentals for Robotics (16811)
- **IITB**: Topics in Machine Learning, Digital Image processing, Artificial Intelligence, Algorithms, Signal processing, Medical Image Processing