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Nilesh Kulkarni

Education

University of Michigan, Ann Arbor, USA — Sept. 2019 -
Ph.D. in Computer Science, EECS
- Advisors: David Fouhey, Justin Johnson

Carnegie Mellon University, Pittsburgh, USA — Aug. 2017 - Aug. 2019
Masters in Robotics, Robotics Institute, School of Computer Science
- CGPA: 4.05/4.0
- Advisor: Abhinav Gupta

Indian Institute of Technology Bombay, Mumbai, India — Jul. 2011 - Jul. 2015
Bachelor of Technology (B.Tech), Computer Science and Engineering with Honours
- CGPA: 8.77/10
- Minor in Electrical Engineering
- Advisor: Suyash Awate, Ganesh Ramakrishnan

Interests

Computer Vision, Machine Learning, and Robotics

Publications

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

Achievements

- 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

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, Branunschweig, Germany — May 2013 - Jul. 2013

Research Intern, Algorithms Group — Sándor P. Fekete

Research Projects

Category Correspondence using 3D — Oct. 2018 - Present
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.
- Work is under-submission at ICLR 2019 — paper

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 suv-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 & 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

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, Artifical Intelligence, Algorithms, Signal processing, Medical Image Processing