Nathaniel Chodosh

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Education

Carnegie Mellon University *Aug. 2017 - May 2024 (expected)*

PhD Candidate in Robotics, School of Computer Science

- Thesis: Test Time Optimization in the Deep Learning Age
- Committee: Simon Lucey, Deva Kannan Ramanan, Noah Snavely

University of Pennsylvania *Aug. 2013 - May 2017*

BSE in Computer Science; Minors in Physics and Math

Research Experience

CMU Center for Autonomous Vehicle Research *Aug. 2017 - present*

Graduate Student Researcher

- LiDAR-based motion analysis and scene understanding under the supervision of Simon Lucey and Deva Ramanan

Argo AI *2018 - 2022 (summers)*

Research Intern

- 2018: LiDAR super-resolution
- 2019: Amodal bounding box regression from point clouds
- 2020: Long-term optical flow
- 2022: LiDAR scene flow

University of Pennsylvania GRASP Lab *Jan. 2014 - May 2017*

Research Assistant

- 2016-2017: Real-time object detection with Jianbo Shi; developed a system for object and pose tracking of musical performances
- 2014-2015: Independent control of multiple untethered nano-robots with Vijay Kumar

Teaching Experience

[CMU] Introduction to Computer Vision (16-720) *Spring 2023*

Guest Lecturer

- Lectured on the fundamentals of deep learning, covering the basics of multi-layer perceptrons and backpropagation; course taught by Deva Ramanan

[CMU] Geometry-Based Methods in Vision (16-822) *Fall 2019*

Teaching Assistant

- Created homework problems, held office hours, organized grading; course taught by Martial Hebert

[CMU] Introduction to Computer Vision (16-720) *Fall 2018*

Head Teaching Assistant

– Created new project assignments to incorporate modern ML techniques, held office hours, organized grading, and gave auxiliary lectures; course taught by Simon Lucey

[edX] Algorithm Design and Analysis *Summer 2017*

Course Developer

– Created Penn's MOOC algorithms course, including planning lectures and developing homeworks, with Sampath Kannan

[Penn] Introduction to Algorithms (CIS 320) *Fall 2016 - Spring 2017*

Teaching Assistant

– Developed exams, held office hours, graded assignments; course taught by Sanjeev Khanna and Sampath Kannan

Publications

Conference Proceedings

Nathaniel Chodosh and Simon Lucey. 2020. *When to use CNNs for Inverse Problems.* In Computer Vision and Pattern Recognition (CVPR 2020). https://arxiv.org/abs/2003.13820.

Nathaniel Chodosh, Chaoyang Wang, and Simon Lucey. 2018. *Deep Convolutional Compressed Sensing for LiDAR Depth Completion.* In 14th Asian Conference on Computer Vision (ACCV 2018). https://arxiv.org/abs/1803.08949.

Elizabeth Hunter, **Nathaniel Chodosh**, Edward Steager, and Vijay Kumar. 2016. *Control of microstructures propelled via bacterial baths.* In IEEE 2016 International Conference on Robotics and Automation. https://ieeexplore.ieee.org/document/7487311. **Best Paper Award.**

Edward Steager, Denise Wong, **Nathaniel Chodosh**, and Vijay Kumar. 2014. *Optically Addressing Microscopic Bioactuators for Real-time Control.* In IEEE 2014 International Conference on Robotics and Automation. https://ieeexplore.ieee.org/document/7139686.

Other Publications (Preprints, Workshops)

Nathaniel Chodosh, Ben Wilson, William Qi, Neehar Peri, Tarasha Khurana, and James Hays. *Argoverse 2.0 Self-Supervised LiDAR Scene Flow Challenge.* In CVPR 2023 Workshop on Autonomous Driving. https://cvpr2023.wad.vision/

Nathaniel Chodosh, Deva Ramanan, and Simon Lucey. 2023. *Re-Evaluating LiDAR Scene Flow for Autonomous Driving.* Under Submission. https://arxiv.org/abs/2304.02150.

Service

Journal Reviewing

International Journal of Computer Vision	2023
Robotics and Automation Letters	2022

Master's Committees

Tarasha Khurana	2023
George Cazenavette	2022
Mosam Dhabi	2021

Robotics Institute PhD Admissions Committee *Dec. 2019 - Jan. 2020*

Student Member

– Reviewed applications for admission to the Robotics Institute PhD program

The Philadelphia Classic *Aug. 2013 - May 2017*

Lead Organizer

– Lead organizer for Penn's semiannual programming competition for high school students, which draws over 250 students from Pennsylvania, Maryland, New Jersey, New York, Virginia, and Florida

Honors and Awards

University of Pennsylvania Computer Science Award	2017
Summa Cum Laude (GPA 3.93 / 4.00)	2017
Tau Beta Pi Engineering Honor Society	2015
Littlejohn Undergraduate Research Grant ($4,500)	2015
Vagelos Undergraduate Research Grant ($1,000)	2015
Bronze Medal, USA Physics Olympiad Exam	2013

Interests

Guitar, chess, generative art, history