Nathaniel Merrill

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Research Interests

Robotics SLAM, sensor fusion, perception, navigation
Vision Scene understanding, semi-dense matching, monocular depth estimation
AI Deep learning, human-robot interaction
Mathematics Statistical modeling, convex/sparse optimization
Computing Low-precision quantization, parallel models

Education

2019–Present **PhD Computer Science**, *University of Delaware*, Newark, DE,
Advisor: Guoquan (Paul) Huang.
2015–2019 **BS Computer Science**, *University of Delaware*, Newark, DE.

Vocational Experience

2019–Present **Research Assistant**, *University of Delaware*, Newark, DE.
2019–Present **Teaching Assistant**, *University of Delaware*, Newark, DE.
Summer 2017 **JPSS Flight Intern**, *NASA Goddard Space Flight Center*, Greenbelt, MD.
2016–2019 **Undergraduate Research Assistant**, *University of Delaware*, Newark, DE.
2016–2019 **Undergraduate Teaching Assistant**, *University of Delaware*, Newark, DE.

Teaching

Fall 2019 **UD CISC275 Honors: Introduction to Software Engineering**, *TA*.
Spring 2019 **UD CISC181 Honors: Introduction to Computer Science II**, *TA*.
Fall 2018 **UD CISC106: Introduction to Computer Science for Engineers**, *TA*.
Fall 2018 **UD EGGG101: Introduction to Engineering**, *TA*.
Spring 2018 **UD CISC106: Introduction to Computer Science for Engineers**, *TA*.
Fall 2017 **UD MEEG211: Dynamics**, *TA*.
Fall 2017 **UD EGGG101: Introduction to Engineering**, *TA*.
Spring 2017 **UD MEEG112: Statics**, *TA*.
Spring 2017 **UD CISC106: Introduction to Computer Science for Engineers**, *TA*.
Fall 2016 **UD EGGG101: Introduction to Engineering**, *TA*.

Publications

Conference Papers

[C4] **N. Merrill**, P. Geneva, G. Huang. "Near-Sighted Monocular Depth Estimation for High-Speed Obstacle Avoidance". In: *2020 IEEE International Conference on Robotics and Automation (ICRA)*. (submitted). Paris, France, May 2020.

[C3] K. Eckenhoff, P. Geneva, **N. Merrill,** G. Huang. "Schmidt-EKF-based Visual-Inertial Moving Object Tracking". In: *2020 IEEE International Conference on Robotics and Automation (ICRA)*. (submitted). Paris, France, May 2020.

[C2] **N. Merrill**, G. Huang. "CALC2.0: Combining Appearance, Semantic and Geometric Information for Robust and Efficient Visual Loop Closure". In: *2019 International Conference on Intelligent Robots and Systems (IROS)*. (accepted). Macau, China, Nov. 2019.

[C1] **N. Merrill**, G. Huang. "Lightweight Unsupervised Deep Loop Closure". In: *Proc. of Robotics: Science and Systems (RSS)*. Pittsburgh, PA, June 2018.

Open Source

CALC **Deep Learning for Loop Closure**, *RSS 2018, IROS 2019*.
https://github.com/rpng/calc
https://github.com/rpng/calc2.0

scikit-cuda **GPU Computation in Python**, *Contributed the PCA module*.
https://github.com/lebedov/scikit-cuda

PyTorch **Deep Learning Library**, *Aided in testing/developing the C++ front end*.
https://github.com/pytorch/pytorch

DL Tutorial **A Tutorial for an MNIST Classifier and VAE**,
https://github.com/nmerrill67/DeepLearningTutorial

Invited Talks

[T4] *Image Classification and VAE Tutorial in Tensorflow*. University of Delaware, Apr. 2019.

[T3] *Lightweight Unsupervised Deep Loop Closure*. Carnegie Mellon University, June 2018.

[T2] *Lightweight Unsupervised Deep Loop Closure*. University of Delaware, May 2018.

[T1] *Deep Learning Tutorial in Tensorflow*. University of Delaware, Oct. 2018.

Awards and Honors

2019 **AAUP-UD Award**, *University of Delaware.*

2017 **First Place Intern Poster Award**, *NASA Goddard Space Flight Center.*

2015 **UD Trustee Scholarship**, *University of Delaware.*

Academic Services

Reviewer:

Journals	IJRR (International Journal of Robotics Research) RAS (Robotics and Autonomous Systems)
Conferences	ICRA (IEEE International Conference on Robotics and Automation) IROS (IEEE/RSJ InternationalConference on Intelligent Robots and Systems)

Professional Membership

ASME

IEEE