

Neehar Peri

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(732) 325-4663

EDUCATION

Ph.D in Robotics, Carnegie Mellon University

Aug 2021 - Present

B.S. in Computer Engineering, University of Maryland - College Park

Aug 2017 - May 2021

QUEST Honors Program

JOURNAL PUBLICATIONS

- [Data and Algorithms for End-to-End Thermal Spectrum Face Verification](#) TBiom 2023
T Bourlai, J Rose, S Mokalla, A Zabin, L Hornak, CB Nalty, N Peri, J Gleason, CD Castillo, VM Patel, R Chellappa

CONFERENCE PUBLICATIONS

- [Rethinking Planners as Ego-Forecasters](#) Under Review
AB Vasudevan, N Peri, D Ramanan
- [ZeroFlow: Fast Zero Label Scene Flow via Distillation](#) Under Review
K Vetter, N Peri, N Chodosh, E Eaton, D Jayaraman, Y Liu, D Ramanan, J Hays
- [Long-Tailed 3D Detection via RGB-LiDAR Fusion](#) Under Review
Y Ma, N Peri*, S Wei, D, Ramanan, W Hua*, Y Li *, S Kong**
- [An Empirical Analysis of Range for 3D Object Detection](#) Under Review
N Peri, M Li*, B Wilson, Y Wang, J Hays, D Ramanan*
- [Towards Long-Tailed 3D Detection](#) CoRL 2022
N Peri, A Dave, D Ramanan, S Kong**
- [A Brief Survey of Person Recognition at a Distance](#) ACSSC 2022
C Nalty, N Peri*, J Gleason*, CD Castillo, S Hu, T Bourlai, R Chellappa*
- [Forecasting from LiDAR via Future Object Detection](#) CVPR 2022
N Peri, J Luieten, M Li, A Osep, L Leal-Taixe, D Ramanan
- [Assessment of a Novel Virtual Environment for Examining Human Cognitive-Motor Performance during Execution of Action Sequences](#) HCII 2022
AA Shaver, N Peri*, R Mezebish, G Matthew, A Berson, C Gaskins, GP Davis, GE Katz, I Samuel, JA Reggia, J Purtilo, RJ Gentili*
- [A Synthesis-Based Approach for Thermal-to-Visible Face Verification](#) FG 2021
N Peri, J Gleason, CD Castillo, T Bourlai, VM Patel, R Chellappa
- [PreferenceNet: Encoding Human Preferences in Auction Design with Deep Learning](#) NeurIPS 2021
N Peri, MJ Curry*, S Dooley, JP Dickerson*
- [The Devil is in the Details: Self-Supervised Attention for Vehicle Re-ID](#) ECCV 2020
P Khorramshahi, N Peri*, JC Chen, R Chellappa*
- [A Dual Path Model with Adaptive Attention for Vehicle Re-ID](#) ICCV 2019††
P Khorramshahi, A Kumar, N Peri, SS Rambhatla, JC Chen, R Chellappa

WORKSHOP PUBLICATIONS

- [ReBound: An Open-Source 3D Bounding Box Annotation Tool for Active Learning](#) CHI 2023†
W Chen, A Edgley*, R Hota*, J Liu*, E Schwartz*, A Yizar*, N Peri*, J Purtilo**
- [Deep k-NN Defense Against Clean-label Data Poisoning Attacks](#) ECCV 2020
N Peri, N Gupta*, WR Huang*, L Fowl, C Zhu, S Feizi, T Goldstein, JP Dickerson*
- [Towards Real-Time Systems for Vehicle Re-ID, Multi-Camera Tracking, and Anomaly Detection](#) CVPR 2020†
N Peri, P Khorramshahi*, SS Rambhatla*, V Shenoy, S Rawat, JC Chen, R Chellappa*
- [Attention Driven Vehicle Re-ID and Unsupervised Anomaly Detection for Traffic Understanding](#) CVPR 2019†
P Khorramshahi, N Peri, A Kumar, A Shah, R Chellappa

*Equal Contribution

*Equal Supervision

†Selected for Spotlight Presentation

††Selected for Oral Presentation

PATENTS

- [End-to-End Streaming 3D Detection and Forecasting from LiDAR Point Clouds](#) 17/692,973
N Peri, D Ramanan

ACADEMIC EXPERIENCE

Carnegie Mellon University, Pittsburgh, PA, *Robotics Institute* Apr 2020 – Present

- Leading research on 3D object detection, multi-object tracking, motion forecasting, and multi-agent planning for autonomous driving applications
- Advisor: [Deva Ramanan](#)

University of Maryland, College Park, MD, *UMIACS* May 2018 – May 2021

- Conducted research in unsupervised traffic anomaly detection and discriminative representation learning for vehicle re-id
- Led research in defending against clean-label adversarial poisoning attacks
- Established novel method for encoding human preferences in revenue maximizing auction design
- Advisors: [Rama Chellappa](#) & [John P. Dickerson](#)

INDUSTRY EXPERIENCE

Argo AI, Pittsburgh, PA, *Research Intern* May 2021 – Oct 2022

- Developed end-to-end 3D object detection and forecasting pipeline from LiDAR point clouds
- Implemented novel metrics that jointly evaluate detection and forecasting accuracy

MUKH Technologies, College Park, MD, *Research Intern* Aug 2020 – May 2023

- Led research on improving thermal-to-visible face synthesis for zero-shot identification
- Built robust face verification pipelines for multi-spectral data streams

Bank of America, Charlotte, NC, *Conversational Commerce Technology Intern* Jun 2019 – Aug 2019

- Developed novel deep learning pipeline to validate quality of utterance-intent pairs in chatbot conversations using PyTorch, AllenNLP, and NLTK
- Deployed RESTful Active Learning API to introduce targeted learning feedback loop and improve intent classification model performance

TEACHING EXPERIENCE

16-720, Carnegie Mellon University, Robotics Institute, *Head Teaching Assistant* Spring 2022, Fall 2022

- Managed team of teaching assistants to effectively coordinate course responsibilities
- Updated course projects, held office hours, answered student questions and graded course projects

ENEE 244, University of Maryland, ECE Department, *Undergraduate Teaching Fellow* Spring 2019

- Led Introduction to Digital Logic recitation for a discussion section of 15 students
- Received highest marks on metrics of preparedness, respect for students, and teaching effectiveness from all students

INVITED TALKS

- [3D Object Detection for Autonomous Vehicles](#) Mar 2023
Guest Lecture: 16-825, Learning for 3D Vision
- [Image Processing and Convolutions](#) Sep 2022
Guest Lecture: 16-720, Computer Vision
- [How do Autonomous Vehicles See the World?](#) Aug 2022
Invited Talk: RoboLaunch
- [Transformers for Vision](#) Apr 2022
Guest Lecture: 16-720, Computer Vision
- [Training Convolutional Neural Networks](#) Apr 2022
Guest Lecture: 16-720, Computer Vision
- [Metrics and Methods for Detection and Forecasting in Autonomous Vehicles](#) Apr 2022
Invited Talk: National Autonomous Vehicle Conference

SERVICE

Conference Reviewer: NeurIPS 20{21,22,23}, CVPR 20{22,23}, AAAI 2023, ICCV 2023

Journal Reviewer: IJCV 2021, PAMI 2023

Mentorship: CMU AI Mentoring Program 20{21, 22}, QUEST Mentoring Program (2022), CMU AI for Social Good Summit (2022)

Organizer: Visual Perception and Learning in an Open World (Onsite Coordinator, CVPR 20{22, 23})

Other: TRINITY HPC Cluster Management 20{22,23}, AUTOBOT HPC Cluster Management 20{22,23}

MENTORSHIP

| Name | Institution | Year(s) | Details |
|----------------------------------------------------------------------------------------------------------------------------|-------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mehar Khurana | CMU | 2023 | Zero-shot 3D detection |
| Anish Madan (w/ Shu Kong) | CMU | 2022 – | Few-shot multi-modal 2D detection |
| Andrew Shen | CMU | 2022 – | Benchmarking modular 3D perception stack for autonomous vehicles |
| Xindi Wu (w/ Aljosa Osep) | CMU | 2022 | Self-supervised multi-modal representation learning for point clouds |
| Aminah Yizar, Andrew Edgley, Ezra Schwartz, Joshua Liu, Raunak Hota, Royce He, Wesley Chen | UMD | 2022 | Project champion for CMSC435 software engineering capstone to build an active learning framework to allow human-in-the-loop 3D object annotation |
| Christopher Nalty | MUKH | 2021-2022 | Synthetic data augmentation for thermal-to-visible face verification |
| Aastha Senjalia, Andrew Vetter, Benjamin Namovicz, Cheyenne Montgomery, Ferzam Mohammad, Matthew Weinberg, Nicholas Revill | UMD | 2021 | Project champion for CMSC435 software engineering capstone to build a visualization platform for autonomous vehicle data. Project won People's Choice Award. |

AWARDS

| Name | Institution | Distinction | Year |
|--------------------------------------------------------------|-------------|-------------|--------------|
| NSF Graduate Research Fellowship | CMU | National | 2023 |
| Maryland Undergraduate Researcher of the Year | UMD | University | 2021 |
| Sujan Guha Memorial Best Senior Thesis Award | UMD | Department | 2021 |
| CRA Outstanding Undergraduate Researcher (Honorable Mention) | UMD | National | 2021 |
| Yurie & Jeong H. Kim Scholarship | UMD | Department | 20{18,19,20} |