

Dennis Melamed

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Experience

- Kitware, Senior Research & Development Engineer** Aug 2021 – Present
- Trained building damage identification systems for satellite imagery, reducing training data needs 1000x.¹
 - Created & released open dataset for training building damage detectors²
 - Designed framework to deconflict multiple object detectors using prior information and detector trust metrics³
 - Architected & developed inspection tool (as lead of 5 person team) for localizing aircraft defects to 5 cm accuracy.
 - Developed pose estimation algorithms & experimental hardware for event camera star tracking, achieving 20 arcsecond accuracy.⁴
- Nextdroid Robotics, Software Intern** June 2018 – Aug 2018
- Deployed sensorless high-precision motor speed control for subsea robotic platform
 - Co-developed high-accuracy image processing for aerial scene understanding
- National Instruments, Software Intern** June 2017 – Aug 2017
- Implemented network interfaces for measurement device drivers to maintain stability on newer platforms
 - Developed encryption systems to allow first-in-company secure device firmware/driver communication
- Robotic Sensor Networks Lab, University of Minnesota, Research Assistant** Feb 2015 – May 2019
- Developed GPS-denied micro-UAV platform for agriculture using ROS, C, and V-REP simulation
 - Designed and trialed computer vision system for micro-UAV control using low-resolution imaging
- Dept. of Civil Engineering, University of Minnesota, Research Assistant** Oct 2015 – May 2016
- Parallelized state-of-art wave propagation algorithms to speed concrete simulations by 10x
 - Designed MN Dept. of Transport user interfaces to ease ground-penetrating radar data analysis

Education

- M.S. in Robotics** Aug 2019 – July 2021
Carnegie Mellon University, Prof. Kris Kitani
Pittsburgh, PA
- Thesis: Learnable Spatio-Temporal Map Embeddings for Deep Inertial Localization⁵
- B.Sci. in Computer Engineering, Summa Cum Laude with Distinction** Sept 2015 – May 2019
University of Minnesota, Prof. Volkan Isler
Minneapolis, MN
- Thesis: Indoor Micro-UAV Navigation with Minimal Sensing (Profs. Volkan Isler & Derya Aksaray)

Skills

Programming Languages: Python, C++, Embedded C, MATLAB, Java
Robotics Tools: Robotics Operating System (ROS), Gazebo, V-REP
Other Tools: Git, Pytorch, OpenCV, scikit-learn, Linux, Latex, Windows Kernel, Blender, QGIS, ONNX, Triton, DVC
Languages: English (native), Russian (native), Spanish (proficient)

Publications

- (1) Rapid Training of Artificial Intelligence Battle Damage Assessment Tools to New Conflicts**
Melamed, D.; Johnson, C.; Brockman, S.; Blue, R.; Hoogs, A.; Morrone, P.; Clipp, B.
Proceedings of the National Security Sensor and Data Fusion Committee (NSSDF), 2023
- (2) Uncovering Bias in Building Damage Assessment from Satellite Imagery**
Melamed, D.; Johnson, C.; Gerg, I. D.; Zhao, C.; Blue, R.; Hoogs, A.; Clipp, B.; Morrone, P.
IGARSS 2024 - 2024 IEEE International Geoscience and Remote Sensing Symposium, 2024
- (3) Multi-ATR Fusion and Ontological Deconfliction for Geospatial Imagery**
Davila, D.; Melamed, D.; Depauw, D.; Anderson, J.
Proceedings of the National Security Sensor and Data Fusion Committee (NSSDF), 2023
- (4) EBS-EKF: Accurate and High Frequency Event-based Star Tracking**
Reed, A. W.; Hashemi, C.; Melamed, D.; Menon, N.; Hirakawa, K.; McCloskey, S.
2025
- (5) Learnable Spatio-Temporal Map Embeddings for Deep Inertial Localization**
Melamed, D.; Ram, K.; Roy, V.; Kitani, K.
2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022

(6) **IDOL: Inertial Deep Orientation-Estimation and Localization**

Sun, S.; Melamed, D.; Kitani, K.

Proceedings of the AAAI Conference on Artificial Intelligence, 2021