Dennis Melamed

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Experience

Kitware, *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 detectors[2]
- Designed framework to deconflict multiple object detectors using prior information and detector trust metrics[3]
- 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.

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 Localization[4]
- Selected Coursework: Kinematics, Dynamics & Control, Localization & Mapping, Reinforcement Learning

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)
- IEEE-Eta Kappa Nu – Omicron Student Chapter – Vice President 2018-2019

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) **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

(5) **IDOL: Inertial Deep Orientation-Estimation and Localization**
Sun, S.; Melamed, D.; Kitani, K.
Proceedings of the AAAI Conference on Artificial Intelligence, 2021