Dennis Melamed

dennismelamed.me | github.com/DennisMelamed | (+1) 763-656-9518
Minneapolis, MN | linkedin.com/in/dennismelamed/ | dennis@dennismelamed.me

Experience

Research & Development Engineer **Kitware** **Aug 2021 - Present**
- Developed building damage identification systems for satellite imagery, reducing training data needs 1000x (P3). Released open source dataset of examples of hyper-local building damage (P5).
- Designed framework to deconflict multiple object detectors using prior information and detector trust metrics (P4).
- Developed tablet-based inspection tool to find & localize defects to 5 cm accuracy on 3D model of 15 meter object.
- Designed pose estimation algorithms and experimental hardware for event-camera star tracking, achieving 10-20 arcsecond accuracy.

Software Intern **Nextdroid Robotics** **June 2018 - Aug 2018**
- Achieved sensorless high-precision motor speed control for subsea robotic platform
- Co-developed high-accuracy image processing on military hardware for aerial scene understanding

Software Engineering Intern **National Instruments** **June 2018 - 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

Reseach Assistant **Robotic Sensor Network Lab, UMN** **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

Reseach Assistant **Dept. of Civil Engineering, UMN** **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*
- Selected Coursework: Kinematics, Dynamics & Control; Localization & Mapping; Reinforcement Learning

B.Sci. in Computer Engineering, Summa Cum Laude with Distinction **Sep 2015 - May 2019**
University of Minnesota 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: Robotic Operating System, 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

P1 **Inertial Deep Orientation-estimation and Localization**
S. Sun, D. Melamed, K. Kitani
AAAI Conference on Artificial Intelligence, 2021

P2 **Learnable Spatio-Temporal Map Embeddings for Deep Inertial Localization**
D. Melamed, K. Ram, V. Roy, K. Kitani
klabcmu.github.io/learned-map-prior/
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022

P3 **Rapid Training of Artificial Intelligence Battle Damage Assessment Tools to New Conflicts**
D. Melamed, C. Johnson, S. Brockman, R. Blue, A. Hoogs, P. Morrone, and B. Clipp
National Security Sensor and Data Fusion Committee (NSSDF), 2023

P4 **Multi-ATR Fusion and Ontological Deconfliction for Geospatial Imagery**
D. Davila, D. Melamed, D. Depauw, and J. Anderson
National Security Sensor and Data Fusion Committee (NSSDF), 2023

P5 **Uncovering Bias in Building Damage Assessment From Satellite Imagery**
D. Melamed, C. Johnson, I. D. Gerg, C. Zhao, R. Blue, A. Hoogs, B. Clipp, P. Morrone
IEEE International Geoscience and Remote Sensing Symposium (IGARSS) 2024