Levi Burner — Postdoctoral Associate

University of Maryland, College Park, MD
lburner@umd.edu • Google Scholar

Education

University of Maryland — **College Park, MD**
Ph.D. in Electrical Engineering, GPA: 3.97/4.0 — Fall 2025
Dissertation: *Foundations of Embodied Representation: Robotics Without a Ruler*
M.S. in Electrical Engineering — Fall 2023
Certificate in Computation and Mathematics for Biological Networks — Fall 2022

University of Pittsburgh — **Pittsburgh, PA**
B.S. in Electrical Engineering, GPA: 3.82/4.0 — Fall 2018

Research Affiliations

Maryland Robotics Center — **University of Maryland**
Postdoctoral Associate in Computer Science — *Fall 2025 – Present*

Intelligent Sensing Lab — **University of Maryland**
Computational Optics: Visual odometry in near darkness, adaptive optics without calibration — *Fall 2025 – Present*

Perception and Robotics Group — **University of Maryland**
Embodied Representation: Robots that operate without calibration to the meter — *Fall 2019 – Present*

Honors and Awards

- **Maryland Robotics Center Postdoctoral Fellowship** — *University of Maryland, Fall 2025*
- **Ann G. Wylie Dissertation Fellowship** — *University of Maryland, Fall 2024*
- **Maryland Robotics Center Graduate Research Assistantship** — *University of Maryland, Summer 2023*
- **Google Open Source Peer Bonus for contributions to MuJoCo** — *Google, April 2023*
- **Outstanding Teaching Assistant Award** — *University of Maryland, Spring 2023*
- **Future Faculty Fellow** — *University of Maryland, Spring 2023*
- **Computation and Mathematics for Biological Networks Fellow** — *University of Maryland, Fall 2020*
- **Dean's Fellowship** — *University of Maryland, Fall 2019*
- **Outstanding Graduate in Electrical Engineering** — *University of Pittsburgh, Fall 2018*
- **Best System Design, Best Technical Paper for Aerial Autonomy** — *RoboNation IARC American Venue, 2018*

Publications

Burner, L., De Croon, G., and Aloimonos, Y. **Artificial Microsaccade Compensation: Stable Vision for an Ornithopter**, *In Preperation.*

Burner, L., Fermüller, C., and Aloimonos, Y. **Embodied Visuomotor Representation**, *npj Robotics, 2025.* Link

Burner, L., Mantripragada, P., Caddeo, G., Natale, L., Fermüller, C., and Aloimonos, Y. **Extremum Seeking Controlled Wiggling for Tactile Insertion** , *Under revision.* Link

Yuan, D., Burner, L., Wu, J., Liu, M., Chen, J., Aloimonos, Y., Fermüller, C., **Learning Normal Flow Directly From Event Neighborhoods**, *ICCV 2025.* Link

Chen, J., Feng, B., Cai, H., Wang, T., Burner, L., Yuan, D., Fermüller, C., Metzler, C., and Aloimonos, Y. **Repurposing Pre-trained Video Diffusion Models for Event-based Video Interpolation**, *CVPR 2025.* Link

Burner, L., Sanket, N. J., Fermüller, C., and Aloimonos, Y. **TTCDist: Fast Distance Estimation From an Active Monocular Camera Using Time-to-Contact**, *ICRA 2023.* Link

Burner, L., Mitrokhin, A., Fermüller, C., and Aloimonos, Y. **EVIMO2: An Event Camera Dataset for Motion Segmentation, Optical Flow, Structure from Motion, and Visual Inertial Odometry in Indoor Scenes with Monocular or Stereo Algorithms**, *ArXiv Technical Report, May 2022.* Link, Videos

Talks

Embodied Representation: Robotics Without a Ruler — **Open Neurmorphic**
Open Neuromorphic Student Talk — *September, 2025*

Embodied Visuomotor Representation — **Unviersity of Maryland**
Communication, Control and Signal Processing Seminar — *November, 2024*

Coupling Control and Vision — **Worcester Polytechnic Institute**
Perception and Autonomous Robotics Seminar Series — *October, 2023*

The Advantages of a Control Theoretic Approach to Monocular Computer Vision — **College Park, MD**
Maryland Robotics Center Student Seminar — *October, 2022*

Industry Experience

Google DeepMind — **Washington D.C.**
Sponsored Contributor to MuJoCo — *November 2024–June 2025*
Developed Python and C++ for parallelized robotics simulation. The contribution now powers numerous research endeavors.

Naval Research Laboratory — **Washington D.C.**
Student Trainee Electrical Engineer — *July 2021–February 2022*
Developed software infrastructure for research in space robotics using MuJoCo, C++, and Python.

Carnegie Robotics LLC — **Pittsburgh, PA**
Software Engineer I — *January 2019–July 2019*
Software Engineering Intern — *June 2018–December 2018*
Designed electronics and software for multi-camera systems operating in extreme environments.

KLC Electronics — **Lake Havasu City, AZ**
Embedded Software Developer — *June 2012–January 2019*
Programmed Microchip PIC based embedded systems for utility grade wind turbines ranging in size from 60 to 750 kW.

Rockwell Automation — **Mayfield Heights, OH**
Embedded Software Engineering Co-Op — *May 2016–December 2016*
Developed methods for memory bus signal integrity evaluation and run-time tests of low-level CPU functions for a safety certified industrial controller. Co-led a team that developed an interactive checker playing robot for recruiting events.

Service

Reviewer for: IEEE Robotics and Automation Letters, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Robotics, ICRA (2022 – 2025), CVPR 2025, Automatica, Signal Processing Letters, Frontiers in Robotics and AI, The Visual Computer

Outreach: Tours, demonstrations, and activities for grade through highschool students visiting the Maryland Robotics Center

Editorial Assistant to the Editor of Short Publications — **Automatica**
Assist Professor André Tits in handling editorial duties for the Short Publications of Automatica — *Fall 2020–Spring 2024*

TA Training and Development Fellow — **University of Maryland**
Lead workshops for all GTA's and mentored incoming GTA's — *Fall 2020–Spring 2021*

Terp's in Space Mentor — **University of Maryland**
Mentor undergraduates to design and propose an experiment for the International Space Station — *Spring 2021*

Technical Director of Undergraduate Robotics Club — **University of Pittsburgh**
Guided growth from 40 to 80 members total, grew funding from 4 to 15 thousand per year — *Spring 2016–Spring 2018*

Teaching

Teaching Assistant **University of Maryland**
CMSC 477: Robotics Perception and Planning *Spring 2023, Spring 2025*

Was the primary designer of the lab instruction for CMSC477, the final course in UMD's first offering of an Undergraduate Robotics Minor. The course was taught by my advisor Professor Yiannis Aloimonos. I attended the American Society for Engineering Education (ASEE) 2023 to showcase the course at UMD's tradeshow booth.

Anonymous student feedback:
- "Levi was the best TA i have ever had. He was very knowledgeable and was easy to approach as well as good at giving advice/answers."
- "Levi was always very encouraging of questions and gave great answers to questions."

ENEE 408I: Capstone Design Project: Autonomous Control of Interacting Robots *Spring 2020 – Spring 2023*
During the summer of 2020, applied for and received $13,000 dollars of funding with Dr. Gilmer Blankenship to redesign course for online presentation during the COVID pandemic. Redesigned the course again in the summer of 2021, with completely custom robots, for the upcoming in-person courses. Dr. Blankenship retired at the end of Spring 2022, and I continued teaching the course with Dr. Shihab Shamma till Spring 2023.

Anonymous student feedback:
- "Levi was one of the best TAs I've had at UMD, he was very knowledgeable on the subject and super helpful. He also helped in a way that helped you learn . . . I feel like I got a lot better at troubleshooting issues on my own thanks to his help."
- "Levi Burner is one of the all time greatest TAs ... approachable to help students work through issues while still proactively helping them realize how they can solve their own problems ... one of those rare people who's sociable while at the same time extremely smart and helpful, and I'm thankful we had him for a TA."
- "Levi is an incredible TA. He's knowledgeable, approachable, and clearly cares about every student. Give him a raise."
- "You are likely one of the 2 top TAs I've had at this university. It is rare for me to ask a deep question of a TA and get a thoughtful, deep, and informative response. I strongly appreciate what you have done for the course."
- "I have never had a TA so engaged in the course and so ready to help at the drop of a hat. He was amazingly impressive at helping us troubleshoot problems and learn new topics throughout the class."

ENEE 661: Nonlinear Control Systems *Spring 2021*
- "TA was very effective at answering questions via Piazza and his efforts helped much during the course."

ENEE 440: Microprocessors *Fall 2020*
- "Levi was a fantastic TA. Always quick to reply and extremely knowledgeable."
- "Responsive to emails, took time to look through tricky issues, ... allowed for meetings outside of his normal office hours."

ENEE 324: Engineering Probability *Fall 2019*
- "Levi always made it a pleasure to come to the early discussion time! He was always very helpful and willing to help"
- "Levi is a great TA and knows his stuff. Really enjoyed going to discussion as he was very helpful."

Undergraduate Papers

Miller, A., Burner, L., Becker, E., Misra, R., Saba, A., and Berti, L. (2018). **A Novel UAV for Interaction with Moving Targets in an Indoor Environment.** *IARC Symposium on Indoor Flight Issues.* Link (Won Best Technical Paper)

Burner, L., and Sharma, N. (2018). **A Wearable Sensing System to Estimate Lower Limb State for Drop Foot Correction.** *Ingenium: Undergraduate Research at the Swanson School of Engineering,* 16-20. Link

Miller, A., and Burner, L. (2017). **Aerial Robot Design for Ground Robot Interaction and Navigation without Landmarks.** *IARC Symposium on Indoor Flight Issues.* Link

Undergraduate Presentations

A Novel UAV for Interaction with Moving Targets in an Indoor Environment **Atlanta, Georgia**
International Aerial Robotics Competition Symposium Presentation *July 2018*
Aaron Miller, Levi Burner, Liam Berti, Evan Becker, and Ritesh Misra (equal contribution) Slides

6 Degree of Freedom Autonomous UAV **Pittsburgh, PA**
Swanson School of Engineering's Design Exposition, Poster Session *April 2018*

Levi Burner, Liam Berti, Long Vo, Ritesh Misra (equal contribution) Poster

Navigation and Control for an Autonomous Multirotor in an Indoor Environment **Pittsburgh, PA**
Pennsylvania Automated Vehicle Summit 2018, Student Poster *April 2018*
Aaron Miller, Levi Burner, Liam Berti (equal contribution) Poster

Functional Electrical Stimulation Control and IMU-Based Limb Angle Estimation **Pittsburgh, PA**
Science 2017 Undergraduate Research Poster Reception *October 2017*
Levi Burner, Dr. Nitin Sharma Poster

Aerial Robot Design for Ground Robot Interaction and Navigation without Landmarks **Atlanta, Georgia**
International Aerial Robotics Competition Symposium Presentation *July 2017*
Aaron Miller, Levi Burner (equal contribution) Slides

Technical and Soft skills

- **Programming Languages:** *Experienced:* Python, C, Matlab *Capable:* ARM assembly, C++, Go
- **Software:** *Experienced:* MuJoCo, OpenCV, ROS, SciPy, NumPy, ChibiOS *Capable:* JAX , PyTorch, Buildroot, LaTeX
- **CAD:** *Capable:* KiCad, SolidWorks *Beginner:* Altium Designer, Eagle, LTSpice
- **Embedded Platforms:** *Experienced:* NVIDIA Jetson, PIC, STM32
- **Other:** *Experienced:* Camera Calibration *Capable:* Electronics and PCB design, 3D Printing