

David Novikov

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| EDUCATION | Weizmann Institute of Science , Rehovot, ISL <i>MSc in Mathematics and Computer Science</i> • Research Area: Computer Vision • GPA: 92.3/100 Oct 2023 - Present |
| | The Ohio State University , Columbus, USA <i>BS in Computer Science and Engineering</i> • Summa Cum Laude • Honors Research Distinction: Vehicle Geolocalization from Drone Imagery • GPA: 4.0/4.0 • Minor: Russian Language and Culture Aug 2019 - Aug 2023 |
| | Cleveland State University , Cleveland, USA <i>Dual enrollment during high school - Physics</i> • GPA: 4.0/4.0 Jan 2018 - May 2019 |
| | Cuyahoga Community College , Cleveland, USA <i>Dual enrollment during high school - Music</i> • GPA: 4.0/4.0 Aug 2015 - Dec 2018 |
| RESEARCH EXPERIENCE | Vehicle Geolocalization from Drone Imagery, ISPRS Ann. Photogramm. Remote Sens. Spatial Inf. Sci., X-2-2024 <u>David Novikov</u> , Paul Sotirelis, and Alper Yilmaz • Oral presentation at ISPRS TC II Mid-term Symposium 2024 • Developed a novel projection method to determine car geo-location from drone footage, robust to GPS-denied environments • Applied GIS-based filtering of image features • Funded by U.S. Air Force Research Lab: Grant AWD-111867 |
| | Dominant Twin Peaks: A Novel Conjecture for the Pathophysiologic Basis of Tremor Frequency & Fluctuation Time in Parkinson's Disease (in review) Furrukh Khan, <u>David Novikov</u> , Brian Dalm, Jessie Xiaoxi, Oliver Flouty, and Evan Thomas • Expedited research by proposing a software solution for a task requiring hardware development, saving 1-1.5 years in research timeline • Contributed to a patent application based on the findings |
| | Intelligent Stroboscopic Image Encoding (ongoing) <u>David Novikov</u> , Tali Dekel, Mark Sheinin • Developed hardware for strobing arbitrary colors at up to 10k Hz • Simulated experiments to develop deconvolution algorithms for long exposure images |
| | Scaling up Drone Detection using Synthetic Data (unpublished) <u>David Novikov</u> , Rohit Gupta, Mubarak Shah • Generated synthetic data with stable-diffusion model • Wrote multithreaded scripts that automated all components of training and testing computer vision models |

- Established higher State-Of-The-Art result by 0.05 mAP@50 and 0.06 mAP@50 while improving inference speed by 176.19% and 140.74% for the FL and NPS drone datasets respectively

SKILLS

Software: Python (pandas, numpy, Pytorch, Tensorflow, OpenCV, MediaPipe), C, C++, Git, C, Dart/Flutter, lua, x86-64 ASM, STM8 ASM, Linux, Make, gdb, Java, MATLAB, SolidWorks

Languages: Russian (native), Hebrew (proficient)

WORK EXPERIENCE

Weizmann Institute

Computational Vision Course Teaching Assistant, *Rehovot, ISL Nov 2024 - Present*

- Answering student questions about computational vision from lectures and homeworks
- Grading

Ubihere

Software Engineering Internship, *Columbus, USA* **June - Sept 2023**

- Developed Raspberry Pi-based system for object GPS positioning and tracking
- Automated data collection and filtering to streamline user workflow.

General Electric Appliances

Software Engineering Co-op, *Louisville, USA* **May – Aug 2021**

- Completed 2 initial patent disclosures to diagnose dishwasher faults
- Improved water level monitoring systems
- Developed device drivers during microchip shortage to transition to new embedded microchips
- Automated materials tracking, reducing time from 1 hour to 5 seconds

General Electric Appliances

Software Engineering Co-op, *remote* **Aug - Dec 2020**

- Developed User Interface and backend for Wall Oven LCD screen using Dart/Flutter
- Generated tests to monitor code test coverage using lcov for line coverage and automated UI tests for functionality

Cleveland State University

Physics Teaching Assistant *Cleveland, USA* **Jan - May 2019**

- Led lab portion of Honors Introduction to Calculus-based Mechanics
- Lectured on and wrote tutorials for applying statistical analysis to lab results to determine experimental error thresholds
- Wrote and conducted new physics labs for science teachers in Cleveland schools

ACADEMIC PROJECTS

OSU Hackathon 2023 – Uncountable

1st place **Oct 2023**

- Sourced and automated the segmentation of 1,101 images for surgery props
- Integrated yolov8 segmentation model, camera, and tracking software to determine if a doctor has left items inside a patients body during a surgery

OSU Hackathon 2022 – De-distracted Driving

1st place **Oct 2022**

- Sourced and automated the annotation of 13,037 images for distracted driving to train computer vision model to detect distracted driving
- Integrated yolov5 model, Arduino, and webcam to detect distracted drivers and alert them using lights and buzzers in real-time

Ohio State Mathematical Contest in Modeling

1st place

Nov 2022

- Modeled Urban Heat Island effect in Durham and how improvements in green spaces will decrease redux heat in the city
- Wrote report recommending where to target green space improvement and provided strategies to optimize the limited budget for redux heat reduction

Directed Reading Program

Area of Study: Matroids

Sept - Dec 2021

- Read *Matroids: A Geometric Introduction* and discussed proofs. Presented on matroids to mathematics graduate students.

LEADERSHIP AND INVOLVEMENT

The Ohio State Autodrive Challenge

Perception team

Sept 2022 - July 2023

- Improved LiDAR and camera fusion algorithm for object detection and tracking
- Diagnosing and accelerating computationally demanding processes to ensure timely object detection and tracking

The Ohio State Society of Women Engineers

HeForSWE Affinity Chair

Nov 2020 - April 2023

- Pilot program lead for male affinity group focusing on facilitating positive and effective allyship towards women and other historically marginalized minorities in engineering
- Volunteering in engineering outreach events to educate and promote Science Technology Engineering and Mathematics for K-12 students

The Ohio State Unicycle Club

Vice President

Aug 2019 - April 2023

- Encouraging and promoting unicycling within The Ohio State community

The Ohio State Hometown Ambassadors

Team Lead

Jan 2021

- Organized presentation with engineering students for alma mater high school to promote and inform students on the opportunities available to them

Cleveland State Society of Physics Students

Fabulous Physics Question Writer

August 2018 - May 2019

- Presented and discussed physics-style riddles to students interested in physics

HONORS AND ACCOLADES

Ohio State University

Undergraduate Research Scholarship, *Columbus, OH*

August 2022 - May 2023

Ohio State University

Provost Scholarship, *Columbus, OH*

August 2019 - May 2023

Cleveland State University

Undergraduate Teaching Assistant of the Year Award, *Cleveland, OH*

2018-2019