Kyle Vedder

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Education

- PhD in Computer Science, University of Pennsylvania (in progress) (2019 – Present)
  - Advisors: Eric Eaton, Dinesh Jayaraman, *GRASP Lab*
- BS in Computer Science, University of Massachusetts (2015 – 2019)
  - Advisor: Joydeep Biswas, *Autonomous Mobile Robotics Lab (AMRL)*

Research Interests

I believe strongly in The Bitter Lesson, and I believe our job as researchers is to find the right tricks, data distributions, and algorithms to scale up deep learning.

I believe one such trick is teaching vision systems to understand motion. My PhD research has focused on training self-supervised models to predict motion via scene flow, and building offline preprocessing pipelines to provide these motion descriptions without labels.

Select Publications

Conferences/Journals

- Ishan Khatri*, **Kyle Vedder***, Neehar Peri, Deva Ramanan, James Hays. *I Can't Believe It's Not Scene Flow!*. European Conference on Computer Vision (ECCV), 2024. [website] [pdf]
- **Kyle Vedder**, Neehar Peri, Nathaniel Chodosh, Ishan Khatri, Eric Eaton, Dinesh Jayaraman, Yang Liu, Deva Ramanan, James Hays. *ZeroFlow: Scalable Scene Flow via Distillation*. Twelfth International Conference on Learning Representations (ICLR), 2024. [website] [pdf]
- Andrea Soltoggio et al. *A collective AI via lifelong learning and sharing at the edge*. Nature Machine Intelligence, 2024. [pdf]
- Megan M. Baker et al. *A domain-agnostic approach for characterization of lifelong learning systems*. Neural Networks, 2023. [pdf]
- **Kyle Vedder**, Eric Eaton. *Sparse PointPillars: Maintaining and Exploiting Input Sparsity to Improve Runtime on Embedded Systems*. Proceedings of the International Conference on Intelligent Robots and Systems (IROS), 2022. [website] [pdf]
- **Kyle Vedder**, Joydeep Biswas. *X*: Anytime Multi-Agent Path Finding For Sparse Domains Using Window-Based Iterative Repairs*. Artificial Intelligence (AIJ), 2021. [website] [pdf]
- **Kyle Vedder**, Joydeep Biswas. *X*: Anytime Multiagent Path Planning With Bounded Search*. Proceedings of the 18th International Conference on Autonomous Agents and MultiAgent Systems (AAMAS), 2019. [website] [pdf]

In Submission

- **Kyle Vedder**, Neehar Peri, Ishan Khatri, Siyi Li, Eric Eaton, Mehmet Kocamaz, Yue Wang, Zhiding Yu, Deva Ramanan, Joachim Pehserl. *Neural Eulerian Scene Flow Fields*. arXiv preprint arXiv:2410.02031, 2024. [website] [pdf]

Challenges

- **Kyle Vedder**, Neehar Peri, Nate, Chodosh, Yang, Liu, James Hays. *Argoverse 2 2024 Scene Flow Challenge at the CVPR 2024 Workshop on Autonomous Driving*. 2024. [website]

Industry Experience

- *Nvidia – Research Intern* (Spring / Summer 2024)
  - Pushing forward scene flow and occupancy flow methods (stay tuned!)
- *Argo AI – Research Intern* (Summer / Fall 2022)
  - Explored 2D and 3D methods for generalizing to the long tail of objects
  - Led to *ZeroFlow* line of scene flow work
- *Amazon Lab126 – Software Development Intern* (Summer 2019)
  - Small object detection on Amazon Astro
- *Google – Software Engineering Intern* (Summer 2017)
  - Automated training data sampling on Ads Quality Metrics
- *Google – Software Engineering Intern* (Summer 2016)
  - Statistical processing for AdWords redesign
- *Unidesk Corporation – C++ Development Intern* (Summer 2015)
  - Windows registry hive manipulation unit testing framework
- *Unidesk Corporation – Robotics Intern* (Summer 2014)
  - Pick and place robot arm control stack for trade show

Honors and Awards

- ZeroFlow was selected as a **highlighted method** in the CVPR 2023 *Workshop on Autonomous Driving* Scene Flow Challenge
- *Goldwater Scholarship Honorable Mention* (2018)
- *Outstanding Undergraduate Course Assistant (CS220 Programming Methodologies)* (Fall 2017)

Academic Experience

- *Academic Reviewer* (2019 – Present)
  - AAAI 2020 – 2022, AAMAS 2021, JMLR 2021, ICRA 2022 – 2023, JSA 2022, ICLR 2023, ICCV 2023 – 2024
- *Research Assistant – Autonomous Mobile Robotics Lab (AMRL), UMass* (2016 – 2019)
- *Teaching Assistant – CIS 519 Applied Machine Learning, UPenn* (Spring 2021)
- *Teaching Assistant – CIS 700 Integrated Intelligence, UPenn* (Fall 2020)
- *Undergraduate Course Assistant – CIS 220 Programming Methodologies, UMass* (2016 – 2017)