Kyle Vedder

kvedder@seas.upenn.edu | vedder.io | github.com/kylevedder | linkedin.com/in/kvedder

Education

University of Pennsylvania
Ph.D in Computer Science *2019 – 2025*

University of Massachusetts Amherst
B.S. in Computer Science *2015 - 2019*

Publications

X*: Anytime Multi-Agent Path Finding for Sparse Domains using Window-Based Iterative Repairs
Kyle Vedder and Joydeep Biswas *2020*

Published in Artificial Intelligence Journal. arXiv:1811.12598

X*: Anytime Multiagent Planning With Bounded Search
Kyle Vedder and Joydeep Biswas *AAMAS 2019 ARMS Workshop*

Selected for AAMAS 2019 Best Papers Volume.

X*: Anytime Multiagent Planning With Bounded Search
Kyle Vedder and Joydeep Biswas *AAMAS 2019 Extended Abstract*

In *Proceedings of the 18th International Conference on Autonomous Agents and MultiAgent Systems*, Montreal, Quebec, CA. July 2019.

Augmenting Planning Graphs in 2-Dimensional Dynamic Environments With Obstacle Scaffolds
Spencer Lane, Kyle Vedder, and Joydeep Biswas *ICAPS 2017 PlanRob Workshop*

In *Proceedings of the 5th Workshop on Planning and Robotics (PlanRob)*, Pittsburgh, PA, USA. June 2017.

Honors & Awards

Goldwater Scholarship Honorable Mention
The Barry Goldwater Scholarship Foundation *2018*

- One of 281 Honorable Mentions selected from a pool of 1280 national nominees.

Outstanding Undergraduate Course Assistant
CS 220 Programming Methodologies *2017*

- Received award for contributions to course development.

Course Citations
Various *2016 - 2018*

- Received course citations for outstanding overall performance in CS 683 Artificial Intelligence, CS 240 Reasoning Under Uncertainty, and CS 187 Data Structures and Algorithms.

Dean's List
Registrar's Office *2015 – 2019*

- Attained Dean's List every semester for achieving above a 3.50 semester GPA.

Academic Experience

Lifelong Machine Learning Lab (LML)

Research Assistant *2019 - Present*

- Core Team lead for Phase 2 of DARPA L2M program.
  - Led multi-University team to develop core infrastructure underpinning Phase 2 system.
- Developed open-source control stack for LML Service Robots from scratch.
  - Code available at *https://github.com/kylevedder/ServiceRobotControlStack*.

Autonomous Mobile Robotics Lab (AMRL)

Research Assistant *2016 - 2019*

- Developed X*, an anytime multiagent planner for realtime systems.
  - Designed, proved correct, implemented, and evaluated all algorithms.
  - Performed literature review and wrote paper with high level editing input from adviser.
- Developed Obstacle Scaffolds, an extension to roadmap based planners that allow for finer path generation near dynamic obstacles.
  - Implemented both baseline and experimental planners.
  - Evaluated the planner in multiple scenarios.
- Founding member of the UMass Minutebots, the RoboCup Small Size League team that serves as a research platform for the development of autonomous realtime systems.
  - Architected and implemented majority of the core software infrastructure for the control stack.
  - Implemented state-of-the-art realtime path planning, low level collision avoidance, and portions of the motion planning system.

Academic Conference Reviewer

AAAI 2020 - 2021, AAMAS 2021 *2019 - Present*

- Served as a peer review for papers on planning and vision.

CIS 700 Integrated Intelligence

Teaching Assistant *Fall 2020*

- Developed Getting Started assignment based on our open-source Service Robot Control Stack code base that developed student familiarity with ROS and prepared them for the class project.
- Stimulated discussion and analysis during in-class paper discussion.

CS 220 Programming Methodologies

Undergraduate Course Assistant *2016 - 2017*

- Worked for three semesters to lead discussion sections, hold office hours, and answer questions on Q&A forum.
- Worked with instructor to improve projects as well as design and enact structural changes to the discussion sections to better suit student needs.

Industry Experience

Amazon Lab126

Software Development Intern *Summer 2019*

- Worked under non-public project on multi-modal vision-based sensor fusion.

Google Inc

Software Engineering Intern *Summer 2017*

- Worked with Ads Quality Metrics team to deliver meaningful statistics about bad ads to inform both business and engineering decisions. Applied techniques from a wide range of areas of Computer Science, from information theory to optimization, to develop tractable solutions to problems involving immense amounts of data, using C++ for performant implementation.

Google Inc

Software Engineering Intern *Summer 2016*

- Worked with AdWords Next Overview team to deliver to users useful, statistics driven insights about their ad campaigns. Wrote FlumeJava data pipeline to do offline statistical analysis on massive customer datasets as well as developed UI components using Dart and AngularDart to display the data.

Unidesk Corporation

C++ Developer *Summer 2015*

- Worked with a team of engineers to successfully design and implement a framework to test proprietary offline Windows registry hive manipulation APIs. Wrote C++ framework to call Win32 APIs to provide setup and validation of registry hives manipulated by Unidesk's registry hive editor.

Unidesk Corporation

Robotics Intern *Summer 2014*

- Worked with the CTO and CMO to successfully implement an articulated robot arm for a trade show to be manipulated by attendees through an iPad. Wrote Java backend to implement a JSON based web service to accept highlevel user input, translating the commands into lowerlevel FORTH commands to choreograph robot movements while avoiding collisions.