Aravind Sivaramakrishnan

aravind.siva@rutgers.edu • +1 (848) 252-8303 • https://people.cs.rutgers.edu/as2578/ • Github: aravindsiv

EDUCATION

Rutgers University, New Brunswick NJ, USA

Ph.D. in Computer Science — 2018 – Present
- Advisor: Kostas E. Bekris

Master of Science (M.S.) in Computer Science — 2016 – 2018
- Cumulative GPA: 3.83 / 4.0

Amrita Vishwa Vidyapeetham University, Coimbatore, India

Bachelor of Technology (B.Tech.) in Computer Science & Engineering — 2011 – 2015
- Cumulative GPA: 8.2 / 10.0 (Graduated with Distinction)

PUBLICATIONS

UNDER REVIEW

[11] Aravind Sivaramakrishnan, Noah R. Carver, Sumanth Tangirala, Kostas E. Bekris, "Roadmaps with Gaps over Controllers: Learning to be Efficient in Planning under Dynamics".

[10] Ewerton R. Vieira, Edgar Granados, Aravind Sivaramakrishnan, Marcio Gameiro, Konstantin Mischaikow, Kostas E. Bekris, "Morse Graphs: Topological Tools for Analyzing the Global Dynamics of Robot Controllers", (extended and revised version).

JOURNAL AND CONFERENCE PAPERS

[9] Ewerton Vieira*, Aravind Sivaramakrishnan*, Sumanth Tangirala, Edgar Granados, Konstantin Mischaikow, Kostas E. Bekris, "MORALS: Analysis of High-Dimensional Robot Controllers via Topological Tools in a Latent Space", in *IEEE International Conference on Robotics and Automation (ICRA), 2024.*

[8] Ewerton R. Vieira, Aravind Sivaramakrishnan, Yao Song, Edgar Granados, Marcio Gameiro, Konstantin Mischaikow, Ying Hung, Kostas E. Bekris, "Data-Efficient Characterization of the Global Dynamics of Controllers with Confidence Guarantees", in *IEEE International Conference on Robotics and Automation (ICRA), 2023.*

[7] Troy McMahon*, Aravind Sivaramakrishnan*, Edgar Granados, Kostas E. Bekris, "A Survey on the Integration of Machine Learning with Sampling-based Motion Planning", *Foundations and Trends in Robotics (FnT ROB)*, 2022.

[6] Troy McMahon, Aravind Sivaramakrishnan, Kushal Kedia, Edgar Granados, Kostas E. Bekris, "Terrain-Aware Learned Controllers for Kinodynamic Planning over Physically Simulated Terrains", in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022.*

[5] Aravind Sivaramakrishnan, Edgar Granados, Seth Katen, Troy McMahon, Kostas E. Bekris, "Improving Kinodynamic Planners for Vehicular Navigation with Learned Goal-Reaching Controllers", in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021*.

[4] Ewerton R. Vieira, Edgar Granados, Aravind Sivaramakrishnan, Marcio Gameiro, Konstantin Mischaikow, Kostas E. Bekris, "Morse Graphs: Topological Tools for Analyzing the Global Dynamics of Robot Controllers", in *15th International Workshop on the Algorithmic Foundations of Robotics (WAFR), 2022.*

REFEREED WORKSHOP PAPERS

[3] Edgar Granados*, Aravind Sivaramakrishnan*, Troy McMahon, Zakary Littlefield, Kostas E. Bekris, "ML4KP: a Light and Flexible Library for Integrating Machine Learning with Sampling-Based Kinodynamic Planners," in *Machine Learning for Motion Planning (MLMP) Workshop at ICRA 2021*.

[2] Seth Karten, Aravind Sivaramakrishnan, Edgar Granados, Troy McMahon, Kostas E. Bekris, "Data-Efficient Learning of High-Quality Controls for Kinodynamic Planning used in Vehicular Navigation," in *Machine Learning for Motion Planning (MLMP) Workshop at ICRA 2021*.

[1] Aravind Sivaramakrishnan, Zakary Littlefield, Kostas E. Bekris, "Towards Learning Efficient Maneuver Sets for Kinodynamic Motion Planning," in *7th ICAPS Workshop on Planning and Robotics (PlanRob).*

WORK EXPERIENCE

Amazon Robotics, Westborough MA, USA — 2023
Applied Scientist II Co-op
- Autonomous coordinated path planning in unstructured environments.

Robert Bosch LLC, Austin TX, USA — 2022
Research Intern
- Sampling-based kinodynamic planning algorithms for autonomous driving among dynamic obstacles.

Preferred Networks Inc., Tokyo, Japan — 2018
Research & Development Intern
- Deep Reinforcement Learning algorithms for multi-task robot learning.

Computer Science Dept, Rutgers University, New Brunswick NJ, USA — 2017 – Present
Instructor / Graduate Teaching Assistant
- CS590: Socially Cognizant Robotics
- CS460/560: Introduction to Computational Robotics
- CS440/520: Introduction to Artificial Intelligence

Mu Sigma Business Solutions Pvt. Ltd., Bangalore, India — 2015 – 2016
Trainee Decision Scientist, Innovation & Development
- Deep Reinforcement Learning algorithms for self-driving GoPiGo robots and paper trading.

RELEVANT SKILLS

Python, C, C++, Java, Keras, PyTorch, Robot Operating System (ROS), Point Cloud Library (PCL), Bullet Physics SDK, MuJoCo, MoveIt, Stable Baselines3, R, MATLAB, Gazebo, SQL, Bash

ROBOT SYSTEMS

KUKA LBR iiwa14, ROBOMANTIS, MuSHR, Fetch

GRADUATE COURSEWORK

Machine Learning, Pattern Recognition, Computational Foundations of Robotics, Algorithmic Robotics, Topics in AI & Optimization, Artificial Intelligence, Data Structures & Algorithms.

MENTORING

Sumanth Tangirala, Dhruv Metha Ramesh (M.S., Rutgers), Kushal Kedia (B.Tech., IIT Kharagpur), Seth Karten (B.S., Rutgers)

ACADEMIC AWARDS

- WAFR2022 Travel Grant — 2022
  Awarded for presenting a paper at WAFR 2022 held at the University of Maryland, College Park.
- Graduate Fellowship — 2018
  Awarded by Dept of CS, Rutgers University for exceptional performance in the MSCS program.
- Outstanding CSE Undergraduate Student Award — 2015
  Top 5% of undergraduate students in the Dept. of CSE, Amrita Vishwa Vidyapeetham University.

PROFESSIONAL ACTIVITIES

- Conference Reviewing
  - *IEEE International Conference on Robotics and Automation (ICRA)* - 2019-24
  - *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* - 2019, 2021, 2023
  - *Workshop on the Algorithmic Foundations of Robotics (WAFR)* - 20-22
  - *International Conference on Automated Planning & Scheduling (ICAPS)* - 2019
- Journal Reviewing
  - *IEEE Robotics and Automation Letters (RA-L)*
  - *IEEE Transactions on Robotics (T-RO)*
- Invited Talks
  - *Improving the Efficiency of Kinodynamic Planning with Machine Learning* - Amazon Robotics, Jun 2023 (Virtual).
- Workshop Organization & Tutorials
  - *DATA-INSPIRE TRIPODS Boot Camp on Data, Dynamics & Control*, Jan 2022.
- Participation
  - *3rd Summer School on Cognitive Robotics*, USC, July 2019.
- Other Service
  - Treasurer, Rutgers Computer Science Graduate Student Society. (2021 - 2022)
  - Volunteer, 2nd IEEE International Symposium on Multi-Robot and Multi-Agent Systems (MRS). (2019)