

RAJAT KUMAR JENAMANI

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EDUCATION

Cornell University

Ph.D. in Computer Science

2021 - Present

GPA 4.13/4.0

Advisor: [Prof. Tapomayukh Bhattacharjee](#)

Indian Institute of Technology Kharagpur

B. Tech. in Computer Science and Engineering

2017 - 2021

GPA 9.68/10.0 (Department Rank 2)

Advisor: [Prof. Partha P. Chakrabarti](#)

PUBLICATIONS

[5] SPARCS: Structuring Physically Assistive Robotics for Caregiving with Stakeholders-in-the-loop

by R. Madan*, [R. K. Jenamani*](#), V. T. Nguyen, A. Moustafa, X. Hu, K. Dimitropoulou, T. Bhattacharjee
In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022 [[PDF](#)]

[4] RCareWorld: A Human-centric Simulation World for Caregiving Robots

by R. Ye*, W. Xu*, H. Fu, [R. K. Jenamani](#), V. Nguyen, C. Lu, K. Dimitropoulou and T. Bhattacharjee
In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022 [[PDF](#)]

Best RoboCup Paper Award Winner, Finalist for Best Paper Award / Best Student Paper Award, IROS 2022

[3] Optimal Multi Agent Pathfinding for Non-Unit Edge Cost Domains and Precedence Constrained Tasks

by [R. K. Jenamani](#)

B. Tech. Thesis - IIT Kharagpur [[PDF](#)]

Finalist for Best Undergraduate Thesis Award 2021 - CSE, IIT Kharagpur

[2] Robotic Motion Planning using Learned Critical Sources and Local Sampling

by [R. K. Jenamani*](#), [R. Kumar*](#), [P. Mall*](#) and [K. Kedia*](#)

In *IEEE International Conference on Robotics and Automation (ICRA)*, 2020 – MLPC Workshop [[PDF](#)]

[1] Deep Learning rooted Potential Piloted RRT* for expeditious Path Planning

by [K. S. Reddy*](#), [M. Bhat*](#), [S. Aggarwal*](#), [R. K. Jenamani*](#), [J. Mukhopadhyay](#)

In *International Conference on Automation, Control and Robotics Engineering (CACRE)*, 2019 [[PDF](#)]

EXPERIENCE

EmPRISE Lab, Cornell University - Graduate Researcher

Aug 21 - Present

Topic: Building Caregiving Robots

Advisor: [Prof. Tapomayukh Bhattacharjee](#)

- Building a robot-assisted feeding system for individuals who require placement of food items inside their mouth for successful bite transfer. Working on integrating real-time shape and pose estimation of users' mouth with a contact-aware model-based controller.
- Proposed SPARCS [5], a framework for physical robot caregiving that facilitates building robotic caregivers with inputs from all stakeholders – care recipients, their caregivers, occupational therapists, and roboticists.
- Created RCareWorld [4], a novel simulation platform that brings care recipients, caregivers and robots together in assistive environments to provide realistic physics-based simulations of robotic caregiving scenarios.

Search Based Planning Lab, Carnegie Mellon University - Research Intern

May 20 - July 20

Topic: Generating movable stacks of household objects

Advisor: [Prof. Maxim Likhachev](#)

- Developed a task planning algorithm that efficiently generates movable stacks of objects from the YCB Dataset by lazily using computationally expensive physics-based simulations along with a custom heuristic.
- Validated the construction feasibility of the generated stacks using a PR2 robot in the real-world.

Personal Robotics Lab, University of Washington - Research Intern

May 19 - July 19

Topic: Multi Agent Motion Planning for Robotic Arms

Advisor: [Prof. Siddhartha Srinivasa](#)

- Adapted multi-agent pathfinding algorithms to variants lazy with collision checking - the computational bottleneck in higher dimensions. Released algorithms as open-source planners that integrate with OMPL.
- Tested on the arms of the Home Exploring Robotic Butler (HERB), thus enabling it to execute bi-manual tasks.

- Multi-Agent Research Group, IIT Kharagpur** - Undergraduate Thesis Jan 20 - May 21
Topic: Multi Agent Pathfinding Advisor: Prof. Partha P. Chakrabarti
- Developed product graphs based algorithms [3] for multi agent pathfinding on roadmaps with non unit edge costs. Proposed method achieves an order of magnitude improvement over baseline.
 - Developed optimal multi agent task allocation and pathfinding algorithms for precedence constrained tasks[3].
- Kharagpur RoboSoccer Students' Group** - AI Team March 18 - May 21
Topic: Cooperative multi-agent systems in dynamic adversarial environments.
- Worked on learning-based motion planning algorithms [1,2] and multi-robot coordination for RoboCup SSL.
- Microsoft** - Software Engineering Intern May 20 - July 20
Topic: Enhancing Outlook Actionable Messages Approval Process Team: Office 365 Ecosystem Team (India)
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AWARDS AND ACHIEVEMENTS

Best RoboCup Paper Award Winner, Finalist for Best Paper Award / Best Student Paper Award, IROS 2022
RCareWorld: A Human-centric Simulation World for Caregiving Robots

Cornell University Ph.D. Fellowship 2021-22

Awarded to select incoming Ph.D. students based on their "exceptional preparation and promise."

Finalist, Best Undergraduate Thesis Award 2021 - CSE, IIT Kharagpur

Optimal Multi Agent Pathfinding for Non-Unit Edge Cost Domains and Precedence Constrained Tasks

Student Par Excellence Award - CSE, IIT Kharagpur

Awarded certificate of 'Student Par Excellence' by IIT Kharagpur for exemplary academic performance.

Tower Research Capital India Merit Scholarship 2020

1 out of 3 students selected from IIT Kharagpur for Tower Research Capital India Merit Scholarship 2020.

SSL RoboCup 2019 - Qualification

Among the top 25 teams in the world that qualified for SSL RoboCup 2019, a 6 vs 6 robot soccer competition.

IIT Entrance Exams

In **top 0.07%** in JEE Mains and **top 1.5%** in JEE Advanced (nationwide exams for admission to IITs).

KVPY Scholarship

Awarded the KVPY Scholarship for scientific research by the Government of India. In **top 0.6%** of applicants.

Talks

Building Robotic Caregivers

- University of Washington Robot Feeding Retreat, 2022 [[Slides](#)]

- Ithaca Office for Aging Network Meeting, 2022 [[Slides](#)]

Democratizing Robotic Caregiving

- Northeast Robotics Colloquium, 2022 [[Slides](#)]

Teaching and Service

Foundations of Robotics, Cornell University - Graduate Teaching Assistant

Aug 22 - Dec 22

Created homeworks for undergrad course, including modules on ROS, state estimation, planning and controls.

SoNIC Workshop, Cornell University - Organizer & Teaching Assistant

Jun 22

Organized the SoNIC Workshop with the aim to inspire underrepresented students to pursue graduate studies in tech fields. Helped participants develop "smart canes" – assistive technology for the visually impaired.

Code Club, IIT Kharagpur - General Secretary

Jan 19 - May 21

Organized intra-institute workshops, hackathons and competitions such as ICPC-style programming contests.

Student Welfare Group, IIT Kharagpur - Mentorship

Aug 19 - May 21

Mentored five freshmen from my department under the aegis of Student Mentor Program.

Technology Robotix Society, IIT Kharagpur - Member

Aug 17 - Mar 18

Conducted seminars and workshops for students at IIT Kharagpur and other colleges.
