

Shohin Mukherjee

DOCTORAL CANDIDATE, THE ROBOTICS INSTITUTE, CMU

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Education

Carnegie Mellon University (CMU)

PH.D. IN ROBOTICS

- GPA: 4.04/4.00

Pittsburgh, USA

August 2018 - Present

Carnegie Mellon University (CMU)

M.S. IN ROBOTICS

- GPA: 4.04/4.00

Pittsburgh, USA

August 2015 - May 2017

Indian Institute of Technology (IIT) Guwahati

B.TECH IN MECHANICAL ENGINEERING WITH A MINOR IN ELECTRONICS AND COMMUNICATION ENGINEERING

- GPA: 9.03/10.00

Guwahati, India

August 2011 - May 2015

Work Experience

Graduate Research Assistant

THE ROBOTICS INSTITUTE, CARNEGIE MELLON UNIVERSITY

Working at the Search-based Planning Laboratory with Prof. Maxim Likhachev on planning algorithms.

Pittsburgh, U.S.A.

August 2018 - Present

Robotics Research Intern

NVIDIA ROBOTICS RESEARCH LAB

Developed machine learning and planning algorithms for multi-step manipulation tasks.

Pittsburgh, U.S.A.

May 2020 - November 2020

Robotics Software Engineer II

SMITH & NEPHEW ROBOTICS

Involved with RnD and software development for the NAVIO Surgical System and related robotic systems for computer-assisted robotic orthopedic surgery.

Pittsburgh, U.S.A.

June 2017 - August 2018

Graduate Research Assistant

THE ROBOTICS INSTITUTE, CARNEGIE MELLON UNIVERSITY

Worked at the Surgical Mechatronics Laboratory with Prof. Cameron Riviere.

Pittsburgh, U.S.A.

August 2015 - May 2017

Projects

Parallelized Planning Algorithms

GUIDE: PROF. MAXIM LIKHACHEV, DIRECTOR, SEARCH BASED PLANNING LAB, THE ROBOTICS INSTITUTE

Developed parallelized planning algorithms for domains with expensive to evaluate edges.

CMU

2020 - Present

Reactive Long Horizon Task Execution via Visual Skill and Precondition Models

GUIDE: DR. CHRIS PAXTON, DR. ARSALAN MOUSAVIAN & PROF. DIETER FOX

Planning for long horizon manipulation tasks with learned skills.

[Video](#)

NVIDIA

May 2020 - November 2020

Planning for Multi-Robot Coverage

GUIDE: PROF. MAXIM LIKHACHEV, DIRECTOR, SEARCH BASED PLANNING LAB, THE ROBOTICS INSTITUTE

Developed an approach to planning for multi-robot coverage. Deployed the algorithm on drones in the real-world.

[Video](#)

CMU

August 2018 - Present

Vision-Based Control of a Handheld Device for Retinal Surgery: Micron

GUIDE: PROF. CAMERON RIVIERE, DIRECTOR, SURGICAL MECHATRONICS LAB, THE ROBOTICS INSTITUTE

Master's thesis on vision based control of Micron: an actively stabilized handheld surgical instrument.

CMU

September 2015 - May 2017

The next generation of the EyeSLAM algorithm using pose graphs.

Recent Publications

ePA*SE: Edge-based Parallel A* for Slow Evaluations

SYMPOSIUM ON COMBINATORIAL SEARCH (SOCS)

2022

Authors: Shohin Mukherjee, Sandip Aine, Maxim Likhachev

MPLP: Massively Parallelized Lazy Planning

ROBOTICS AND AUTOMATION LETTERS (RAL)

2022

Authors: Shohin Mukherjee, Sandip Aine, Maxim Likhachev

Reactive Long Horizon Task Execution via Visual Skill and Precondition Models

Video

IEEE/RSJ INTERNATIONAL CONFERENCE ON INTELLIGENT ROBOTS AND SYSTEMS (IROS) 2021

2021

Authors: Shohin Mukherjee, Chris Paxton, Arsalan Mousavian, Adam Fishman, Maxim Likhachev and Dieter Fox

A Planning Framework for Persistent, Multi-UAV Coverage with Global

Video

Deconfliction

FIELD AND SERVICE ROBOTICS 2019

2019

Authors: Tushar Kusnur*, Shohin Mukherjee*, Dhruv Saxena, Tomoya Fukami, Takayuki Koyama, Oren Salzman and Maxim Likhachev

Open-source Libraries

- **Parallel Planning Algorithms:** https://github.com/shohinm/parallel_search

Honors & Awards

2014 **Gold medalist**, HONDA Young Engineer and Scientist Award 2013, Honda Foundation (Media)

India/Japan

2013 **Scholarship**, Japanese Student Services Organization

Hokkaido, Japan

Technical Skills

- **Programming languages:** C/C++, Python
- **Libraries:** PyTorch, Tensorflow, OpenCV
- **Simulation and prototyping:** MATLAB
- **Operating system:** Linux

Teaching Experience

- **16-350 Planning Techniques for Robotics, Spring'19:** Graduate Teaching Assistant, CMU RI
- **16-782 Planning and Decision-making in Robotics, Fall'19:** Graduate Teaching Assistant, CMU RI

References

- Prof. Maxim Likhachev, Associate Professor and Director, Search Based Planning Laboratory The Robotics Institute, Carnegie Mellon University.
Email: maxim@cs.cmu.edu
- Dr. Christopher Paxton, Research Scientist, Robotics Research Lab, NVIDIA.
Email: cpaxton@nvidia.com
- Dr. Arsalan Mousavian, Research Scientist, Robotics Research Lab, NVIDIA.
Email: amousavian@nvidia.com
- Prof. Cameron Riviere, Research Professor and Director, Surgical Mechatronics Laboratory, The Robotics Institute, Carnegie Mellon University.
Email: camr@ri.cmu.edu