Sourish Ghosh

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Languages and Tools:
C/C++, Python, OpenCV, ROS,
TensorFlow, Pytorch,
AirSim, Gazebo, MATLAB, Docker

Education

Carnegie Mellon University — August, 2019 - *present* — **Ph.D.** in Robotics
Department: Robotics Institute
GPA: 4.0/4.0

Indian Institute of Technology (IIT), Kharagpur — July, 2014 - April, 2019 — **Integrated M.Sc.**
Department: Mathematics
Major: Mathematics and Computing
GPA: 8.5/10

Experience

Carnegie Mellon University | Ph.D. student, AirLab — *Adviser*: Prof. Sebastian Scherer | Aug, 2019 - *present*
Topic: Long-range vision-based aircraft detection, tracking, and motion estimation
Research Areas: small object detection, object tracking, deep learning, state estimation

Princeton University | Summer Intern, IRoM Lab — *Adviser*: Prof. Anirudha Majumdar | June - Aug, 2018
Topic: Learning Data-Driven Dynamic Models of Task-Relevant Perceptual Features for Robot Controllers
Research Areas: control theory, deep learning, variational autoencoders, model-predictive control

NASA Jet Propulsion Laboratory | Summer Intern, Group 347E — *Adviser*: Dr. Masahiro Ono | May - July, 2017
Topic: Probabilistic Kinematic State Estimation for Motion Planning of Planetary Rovers
Research Areas: probabilistic state estimation, risk-aware motion planning

University of Massachusetts Amherst | Summer Intern, AMRL — *Adviser*: Prof. Joydeep Biswas | May - Aug, 2016
Topic: Joint Perception and Planning for Efficient Obstacle Avoidance using Stereo Vision
Research Areas: obstacle avoidance, stereo vision, motion planning

Aerial Robotics Lab, Kharagpur | Software Team Member — *Adviser*: Prof. Somesh Kumar | Feb, 2017 - Apr, 2019
Topic: Building unmanned emergency aerial vehicles to drop medical supplies in less accessible regions of rural India.
Research Areas: localization and mapping, motion planning, control theory

Selected Publications

[4] **MAARS: Machine learning-based Analytics for Automated Rover Systems**
by Masahiro Ono, Brandon Rothrock, . . . , Sourish Ghosh, . . . , Hyoshin Park
In *2020 IEEE Aerospace Conference*. Mar 2020. [PDF]

[3] **Probabilistic Kinematic State Estimation for Motion Planning of Planetary Rovers**
by Sourish Ghosh, Kyohei Otsu, and Masahiro Ono
In *Intelligent Robots and Systems, IROS, 2018 IEEE/RSJ International Conference*, (Madrid, Spain). Oct 2018. [PDF]

[2] **Fast Approximate Clearance Evaluation for Rovers with Articulated Suspension Systems**
by Kyohei Otsu, Guillaume Matheron, Sourish Ghosh, Olivier Toupet, and Masahiro Ono
In *Journal of Field Robotics*. July 2019. [PDF]

[1] **Joint Perception And Planning For Efficient Obstacle Avoidance Using Stereo Vision**
by Sourish Ghosh and Joydeep Biswas.
In *Intelligent Robots and Systems, IROS, 2017 IEEE/RSJ International Conference*, (Vancouver, Canada). Sep 2017. [PDF]

Selected Open-Sourced Projects

Stereo Dense 3D Reconstruction Tool
3D reconstruction using ELAS. [CODE]

JPP
C++ implementation of [1]. [CODE]

RRT Simulator
Visualizing RRTs. [CODE]

PyBullet Turntable Controller
Task-relevant features for MPC. [CODE]

Generating Disparity Maps
Algorithms for disparity maps. [CODE]

Stereo Camera Calibration Tools
[PINHOLE] [FISHEYE] [BLOG]

Media Coverage

Princeton University News — August, 2018
My work at Princeton University was featured as part of a story about the International Summer Internship Program.

Internshala Blog — September, 2017
My summer internship story at NASA JPL was covered by Internshala, India's largest portal for student internships.