

# SOURISH GHOSH

address:  
A-318, LBS Hall  
IIT Kharagpur,  
Kharagpur, WB 721302 INDIA

web: <http://sourishghosh.com>  
email: [sourishg@iitkgp.ac.in](mailto:sourishg@iitkgp.ac.in)  
phone: +91 8902234618  
GitHub: <https://github.com/sourishg>

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## EDUCATION

Indian Institute of Technology, Kharagpur	July, 2014 - April, 2019 ( <i>expected</i> )	<b>Integrated M.Sc.</b> <i>Department:</i> Mathematics <i>Major:</i> Mathematics and Computing
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## PUBLICATIONS

**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. *To Appear*.

**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](#)]

**A Fuzzy Logic System to Analyze a Student's Lifestyle**  
by Sourish Ghosh et al.  
In *2017 9th International Conference on Advanced Computational Intelligence, ICACI*, (Doha, Qatar)  
Feb. 2017. [[PDF](#)]

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## RESEARCH EXPERIENCE

<b>Princeton University</b> , Princeton, NJ Summer Intern, iRoM Lab <i>Topic:</i> Learning Data-Driven Dynamic Models of Task-Relevant Perceptual Features for Robot Controllers <i>Research Areas:</i> control theory, deep learning, variational autoencoders, model-predictive control <i>Adviser:</i> <a href="#">Dr. Anirudha Majumdar</a>	June, 2018 - August, 2018
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<b>NASA Jet Propulsion Laboratory</b> , Pasadena, CA Summer Intern, 347E - Robotic Systems Estimation, Decision, and Control Group <i>Topic:</i> Probabilistic Kinematic State Estimation for Motion Planning of Planetary Rovers <i>Research Areas:</i> probabilistic state estimation, risk-aware motion planning <i>Adviser:</i> <a href="#">Dr. Masahiro Ono</a>	May, 2017 - July, 2017
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<b>University of Massachusetts</b> , Amherst, MA Summer Intern, Autonomous Mobile Robotics Lab <i>Topic:</i> Joint Perception and Planning for Efficient Obstacle Avoidance using Stereo Vision <i>Research Areas:</i> obstacle avoidance, stereo vision, motion planning <i>Adviser:</i> <a href="#">Dr. Joydeep Biswas</a>	May, 2016 - August, 2016
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<b>Aerial Robotics Kharagpur (ARK)</b> , IIT Kharagpur Software Team Member <i>Topic:</i> Building unmanned aerial vehicles to drop medical supplies in less accessible regions of rural India. <i>Research Areas:</i> autonomous safe navigation, localization and mapping, motion planning <i>Adviser:</i> <a href="#">Dr. Somesh Kumar</a>	February, 2017 - <i>present</i>
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## SELECTED PROJECTS

### Stereo Dense 3D Reconstruction Tool

This is a ROS package for real-time 3D reconstruction from stereo images. It uses LIBELAS for generating dense disparity maps. It also has a tool for transforming point clouds in different reference frames.

*Repository:* [https://github.com/umass-amrl/stereo\\_dense\\_reconstruction](https://github.com/umass-amrl/stereo_dense_reconstruction)

### JPP

C++/ROS implementation of the paper: Joint Perception And Planning For Efficient Obstacle Avoidance Using Stereo Vision

*Repository:* <https://github.com/umass-amrl/jpp>

### RRT Simulator

An interactive GUI application for visualizing the RRT algorithm for motion planning.

*Repository:* <https://github.com/sourishg/rrt-simulator>

### Stereo Camera Calibration Tools

Tool for the calibration of monocular and stereo cameras using the checker-board method for both pinhole and fisheye model lenses.

*Pinhole Model:* <https://github.com/sourishg/stereo-calibration>

*Fisheye Model:* <https://github.com/sourishg/fisheye-stereo-calibration>

### Eye Tracker Gaze Analyzer

A Visual C++ application to analyze a user's gaze response on different images displayed on a computer screen using the Tobii Eye Tracker.

*Adviser:* [Dr. Priyadarshi Patnaik](#)

*Repository:* <https://github.com/sourishg/tobii-eye-tracker>

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## RESPONSIBILITIES

### Technology Robotix Society, IIT Kharagpur

*Governor*

July, 2017 - April, 2018

I led a three-tier team to successful planning and execution of all the year-long activities of the society which includes organizing the annual Robotix fest, conducting seminars and workshops for students at IIT Kharagpur and other colleges in India, and initiating new research projects in robotics.

*Head*

February, 2016 - January, 2017

I was responsible for designing a computer vision event which was held at *Kshitij 2017*, IIT Kharagpur's techno-management fest. I helped conduct technical workshops across India to spread the culture of robotics. Also I organized weekly lectures on autonomous robotics for over 300 students round the year along with workshops and hackathons in my college.

### Kharagpur Winter of Code (KWOC) 2017, IIT Kharagpur

December, 2017

Mentor

I mentored 4 students in KWOC (organized by *Kharagpur Open Source Society*) which is a 5-week long GSoC-styled programme for students who are new to open source software development.

Project: <https://github.com/sourishg/stereo-calibration>

### IEEE Robotics Winter Workshop, IIT Kharagpur

December, 2015

Image Processing Mentor

I conducted a week-long workshop for first and second year undergraduates at IIT Kharagpur. I taught basic image processing using OpenCV and C++, and micro-controller programming using an Arduino UNO board. As a final project of the workshop I helped the students build a simple object tracking differential drive robot.

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## AWARDS AND ACHIEVEMENTS

### Caltech SURF Award Recipient

May, 2017 - July, 2017

Awarded the prestigious Caltech SURF fellowship for doing a summer internship on probabilistic motion planning for Mars Rovers at NASA JPL.

### INSPIRE Scholarship Recipient

July, 2014 - *present*

A prestigious scholarship awarded by the Government of India to the top 0.07% students who appeared for the JEE Advanced examination in India, and pursuing a career in Science.

### Bronze at MiroSot, FIRA

July, 2015

MiroSot is an international five-a-side robot soccer tournament. I was a part of the bronze-winning team of IIT Kharagpur.

### Best Term Project, Soft Computing Course

Spring, 2016

Designed a mobile application that tracks the daily lifestyle of a person. Peer reviewed as the best project.

### Best Fresher, HackerEarth Freshers' Challenge, IIT Kharagpur

October, 2014

Finished first amongst all first years in an ACM-ICPC style coding contest organised by HackerEarth.

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## MEDIA COVERAGE

### [Internshala Blog](#)

September, 2017

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

### [Princeton University News](#)

August, 2018

My work at Princeton University was featured as part of a story about the International Summer Internship Program.

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## SKILLS

### Languages

C/C++, Python, Java,  $\text{\LaTeX}$

### Libraries and Tools

OpenCV, ROS, Eigen, TensorFlow, Keras, PyBullet, Qt, GNU Octave, Android SDK

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