

SOURISH GHOSH

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EDUCATION

Indian Institute of Technology, Kharagpur	July, 2014 - April, 2019 (<i>expected</i>)	Integrated M.Sc. <i>Department:</i> Mathematics <i>Major:</i> Mathematics and Computing <i>CGPA:</i> 8.45/10
Garden High School, Kolkata	April, 2012 - February, 2014	Indian School Certificate Board <i>Aggregate:</i> 94%

PUBLICATIONS

Probabilistic Kinematic State Estimation for Motion Planning of Planetary Rovers

by Sourish Ghosh, Kyohei Otsu, and Masahiro Ono
In *IEEE Robotics and Automation Letters*, 2018 (submitted)

Fast Approximate Collision Detection for Kinematically Constrained Articulated Suspension Systems

by Kyohei Otsu, Guillaume Matheron, Sourish Ghosh, Olivier Toupet, and Masahiro Ono
In *IEEE Robotics and Automation Letters*, 2018 (submitted)

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. [\[PDF\]](#)

RESEARCH EXPERIENCE

NASA Jet Propulsion Laboratory May, 2017 - July, 2017
Summer Intern, 347E - Robotic Systems Estimation, Decision, and Control Group
Topic: Risk-aware Probabilistic Motion Planning for **Mars 2020** and future Mars Rovers
Research Areas: probabilistic state estimation, risk-aware motion planning
Adviser: [Dr. Masahiro Ono](#)

University of Massachusetts Amherst May, 2016 - August, 2016
Summer Intern, Autonomous Mobile Robotics Lab
Topic: Joint Perception and Planning for Efficient Obstacle Avoidance using Stereo Vision
Research Areas: obstacle avoidance, stereo vision, motion planning
Adviser: [Dr. Joydeep Biswas](#)

Aerial Robotics Kharagpur (ARK), IIT Kharagpur February, 2017 - *present*
Software Team Member
Building an autonomous UAV to drop medical supplies in rural inaccessible areas. This is a project funded by the Indian Council of Medical Research (ICMR).
Research Areas: autonomous navigation, localization and mapping, motion planning
Adviser: [Dr. Somesh Kumar](#)

Software Team Member

Implemented motion planning algorithms for RoboCup Small Sized League and MiroSot, FIRA. Bronze winning team member at MiroSot, FIRA 2015.

Research Areas: multi-agent robot systems, robot soccer, motion planning

PROJECTS

Stereo Dense 3D Reconstruction Tool

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

Repository: https://github.com/umass-amrl/stereo_dense_reconstruction

RRT Simulator

Developed an interactive GUI interface to simulate a path generated by RRTs avoiding obstacles using C++ and Qt.

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

Stereo Camera Calibration Tools

Developed some tools for the calibration of stereo cameras using the checker-board method using C++ and OpenCV for both pinhole model 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

Interfaced a Tobii Eye Tracker using Visual C++ and OpenCV to analyze a user's gaze response on different images displayed on a computer screen.

Adviser: [Dr. Priyadarshi Patnaik](#)

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

Soft Computing Term Project

Developed an Android application that determines the lifestyle of a person. A fuzzy logic based approach was used to generate an analysis of how a person spends his/her day based on his/her phone's GPS data and how much time he/she spent at a particular location. Peer reviewed to be the best term project for Spring 2016.

Adviser: [Dr. Sudhir Kumar Barai](#)

Repository: <https://github.com/nishnik/YOLO>

code.fun.do, Microsoft Hackathon

Developed a mobile game for Windows Phone using C# and XAML. The idea of the game is to stop incoming missiles by tapping on them, before they reach their target.

Repository: <https://github.com/sourishg/saving-private-ryan>

RESPONSIBILITIES

Technology Robotix Society, IIT Kharagpur

Governor

July, 2017 - *present*

I am leading a three-tier team to successful planning and execution of all the year-long activities of the society which include 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*, Asia's largest 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.

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.

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.

SudoCode, Kshitij 2015

January, 2015

Participated in an online coding competition at *Kshitij 2015*, Asia's largest techno-management fest. Awarded the best fresher at IIT Kharagpur.

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.

Inter IIT Sports Meet

December, 2014

Represented IIT Kharagpur in table tennis and secured the bronze medal.

Table Tennis State Championship, West Bengal

November, 2010

Member of South 24 PGS District silver winning table tennis team.

SKILLS

Programming

C, C++, Java, Python, \LaTeX

Libraries and Tools

OpenCV, ROS, Eigen, Ceres Solver, Qt, GNU Octave, Android SDK
