SOUMYADEEP MUKHERJEE

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EDUCATION

Indian Institute of Technology, Kharagpur *July 2016*
Integrated Bachelor & Masters in Engineering
Thesis: Decentralized aerial robots to track objects in 3D
Cambridge School Noida, Uttar Pradesh
CBSE Grade 12 Exam - 91.6 % *July 2011*
CBSE Grade 10 Exam - 94.33 % *July 2009*

RESEARCH EXPERIENCE

Moving Baseline Stereo for Fisheye cameras May - July 15'
Research Assistant *Max Planck Institute of Biological Cybernetics, Germany*

· Advised by Dr. Aamir Ahmad, Developed a stereo-imaging from fish-eye camera using plane-sweep stereo and then extended it to decentralised set of aerial robots. Assembled multiple aerial robots with odroids for on-board processing. Also, Developed a ROS Wrapper for ARM Boards for Basler Ace USB 3.0 Camera and designed Camera Holder Parts which were 3D printed. **Paper in Progress**.

Vision Based Pedestrian Tracking for ADAS May - July '14
Research Assistant *Nanyang Technological University, Singapore*

· Advised by Prof. Thambipillai Srikanthan, Developed a kalman-filter based multiple pedestrian tracker for Advanced Driver Assistance System from moving camera feed estimating the ego-motion using computer vision techniques. Increased detection speed by $\tilde{\mathbf{2}}$**x** using tracking data by reducing the search area for detection.

Autonomous Soccer Playing Robots March '12 - November '14
Student Coordinator & AI Team Member *Department of Computer Science and Engineering,IIT Kharagpur*

· Advised by Prof. Jayanta Mukhopadhyay, Contributed to designing the strategy for minitature differential drive robots playing soccer using a 3-tier software architecture for making decisions during the game. Also, developed the vision module for detection and tracking of position & orientation robots from over-head camera. Designed a ROS framework for the same architecture. Led the contingent of IIT Kharagpur to participate in **FIRA World Cup Malaysia 2013 and Beijing 2014** for Simurosot and Mirosot League. Also mentored the students to win the **Bronze medal** at **FIRA World Cup Dajeon 2015**.

Decentralised Terrain Exploration with Robot Swarms January '15 - Present
Researcher *Department of Computer Science and Engineering ,IIT Kharagpur*

· Advised by Prof. Pallab Dasgupta, Initiated one of the few swarm robotics research groups in India. Working on developing and implementing an algorithm using algebraic topology to cover maximum sensor coverage using decentralised system of robots.

SOFTWARE PROJECTS

- **Gallery Goggles** - Developed a deep-learning based text based image search for windows and android phones. Setup an open source deep-learning framework Caffe on a server and then queried it for tags from phone app .
- **Relative Attribute Feedback** - A novel way of searching for products on e-commerce websites using attributes. Implemented rank-SVM to rank images of products in order of all attributes to prune away results of the search which do not match with the users attribute feedback on images.
- **Pocket Rocket** - A multi-player game for Windows Phone using accelerometer and bluetooth built using HTML5. Used Construct to develop the game with accelerometer and touch based control with online high-score stored in Azure SQL Database. **100+** downloads.

- **Mosaiq** - Software to stitch scanned torn paper pieces. Implemented a globally consistent reconstruction method using a turning function to prune down candidates. Managed partial reconstruction, reducing pieces by **50%**.

ACHIEVEMENTS & AWARDS

Awarded as one of **25 Tech-Innovators under 25** by Campus Diaries, a community based journalism platform.

Placed at **AppDynamics** for Software Engineer position during Campus Placements.

Selected for **MIT Media Lab RedX Innovation for Billions Camp 2016** and built a health technology prototype using deep-learning for an automatic screening/diagnosis tool to aid doctors.

Campus Winners of Goldman Sachs Quantify 2015 by solving three real world problems on risk modelling, tick engine software and bond clustering. Represented IIT Kharagpur at the finals out of **300+** which participated.

Selected for **KVPY** (Kishore Vaigyanik Prasar Yojana) Scholarship in 2011 given to **top 1%** of students.

Qualified for **ACM ICPC Regional Finals 2013** ranking among **top 100** teams out of **2000+** teams.

Qualified for **Semi-Finals of Google Cloud Developers Challenge 2013**.

Secured **AIR 19** in National Cyber Olympiad 2011 , **AIR 6** in Heritage India Quiz organized by CBSE and ranked **top 1%** in Uttar Pradesh in National Standard Examination for Chemistry by Homi Bhabha Research Centre.

POSITIONS OF RESPONSIBILITY

Student Coordinator August 2015 to Present
Centre for Excellence in Robotics *Link*

· Initiated the **first-ever institute body** for robotics at IIT Kharagpur with the first grant of 5 Crores($1mn). Supervised the website design and currently the **sysadmin** for the same. Also, the current **Chair** for the first ever student body for Centre for Excellence in Robotics.

Student Coordinator January 2015 to Present
Aerial Robotics Kharagpur *Link*

· Initiated and got a grant of **25 Lakhs INR**($40k) from the institute for the first ever aerial robotics project at IIT Kharagpur. Managing a team of 20 working to participate at **IARC 2016**. Collaborated with **Max Planck Institute of Biological Cybernetics** to use and develop Telekyb - Aerial Robotics Software Framework. Expanded the project to use **drones for agriculture** with help from department of agriculture and food engineering, IIT Kharagpur.

Governor August 2014 - June 2015
Technology Robotix Society *Link*

· Held **highest student position in University Robotics Club**; supervised a team of 50 students in promoting robotics across IIT Kharagpur and India. Obtained **certification from IEEE** student branch of IIT Kharagpur and equipment support from **Texas Instruments** for conducting winter workshop in December 2014 and **Initiated Kharagpur Robotics and Intelligence Seminar Series** (KRISS) for open discussions on robotics among students of IIT Kharagpur. Initiated and Managed an open to all students **Maker-Space Lab** to build innovative hardware products using state-of-art machining and electronics tools.

TECHNICAL STRENGTHS

Relevant Coursework	**Undergraduate**: Robotics, Algorithms, Machine Learning
	On-line: Computer Vision, AI, Computer Networks
Computer Languages	**Proficient**: C, C++, Python, LaTeX, Bash
	Familiar: Java, Javascript, jQuery, SQL, C#
Web-Development	Django, PHP, Codeigniter, CSS, HTML
Softwares & APIs	ROS, Gazebo, OpenCV, MATLAB, Simulink, SolidWorks, Android SDK
Embedded Systems	AVR, Arduino, Beagleboard, Odroid