Manash Pratim Das

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Education

Indian Institute of Technology, Kharagpur, India
Integrated M.Tech July '14 - July '19 (Expected)
Research Interests: Robot Perception, Motion Planning, Computer Vision

Publications

Conference

[1] **Manash Pratim Das** , Gaurav Gardi, Jayanta Mukhopadhyay, 5-DoF Monocular Visual Localization Over Grid Based Floor, *International Conference on Indoor Positioning and Indoor Navigation (IPIN) 2017*
Link to document

Work Experience

Air Lab, RI, Carnegie Mellon University, USA | Research Internship May - July 2017
Advised by: Dr. Sebastian Scherer

- Technologies: Microsoft HoloLens, Ceres Solver, C#, C++.
- Demo Video: Augmenting Inspection Capabilities with Mixed-Reality
- Developed a novel futuristic system that enables precise and easy inspection for large infrastructures.
- Proposed a **modified Binary Shape Context descriptor** for 3D point clouds to improve robustness.
- User localization with **point cloud registration** and image based **spherical projection-point optimization**

Aerial Robotics Kharagpur | Student Research Group March 2015 - Present
Guided by: Prof. Somesh Kumar | Prof. Jayanta Mukhopadhyay

- Technologies: ROS, Gazebo, C++, python.
- Researched and developed a 5-DOF localization of micro aerial vehicle (MAV), over a floor with grid lines, using **non-linear least squares optimization** and only a single downward facing camera.
- Implemented 6-DOF localization of MAV in GPS denied, indoor environment using monocular camera, px4flow and IMU through **multi-sensor data fusion** .
- Implemented computer vision algorithms for detection of ground robots, using **feature detection** and **machine learning** that includes HAAR, HOG, FHOG and YOLO darknet.
- Designed software architecture and **Gazebo Simulation Environment** for autonomous micro aerial vehicle to participate in **IARC 2016** .
- Developed a gradient descent based **P, I, D optimizer** . PID controller achieved stable tuning quicker, imitating human operator's controls.

Autonomous Ground Vehicle | Student Research Group March 2015 - March 2016

- Researched and developed a traffic sign detection and recognition system based on **neural networks** and TensorFlow(Deep MNIST for Experts tutorial) which achieved an accuracy of **80% on "GTSRB" dataset** .
- My contributions: github.com/ManashRaja/ml-traffic-sign-recognition

SugarLabs | Open Source contribution February 2016 - November 2016

- Contributed two major features, "proxy server settings" and "registration to multiple XSCE school servers", out of which the former has been incorporated into the **latest official release 0.110** .
- Contributed **900+** lines of code in python including 3 other bugs and enhancements.
- My contributions: manashpratim.in/SugarLabs

cctvmails | Independent project June 2016 - July 2016

- Project link: github.com/ManashRaja/ai_cctv

- Developed a software solution for cctv monitoring to detect anomaly with higher **precision and recall** . It can be easily integrated to existing standard cctv ndvrs without buying any hardware.
- Deployed the multi-threaded service at **Amazon EC2** cloud servers and is being scaled for public service.

Skills

Computer Languages:	**Proficient** : C++, Python
	Experience : C#, JavaScript, Octave, PHP
Robotics:	ROS, Gazebo, Arduino, FSM, rviz, Ceres Solver
Relevant Coursework:	**Undergraduate** : Advanced Graph Theory,
	Probability and Statistics, Partial Differential Equations
	Intelligent Game Theory, Computational Neuroscience
	On-line : Algorithms, Machine Learning
	Artificial Intelligence for Robotics, Computer Vision
	Probabilistic Graphical Models

Achievements

August, 2017	**Most Innovative Design**	International Aerial Robotics Competition 2017
September, 2016	**Best Team Co-ordination Award**	International Aerial Robotics Competition 2016 Represented India and IIT Kharagpur at the event
April, 2016	**Phase I Winner**	GreyOrange Accelerated Learning challenge Proposed indoor reconnaissance by aerial vehicles
Feb, 2015	**1st Position**	National image processing, robotics event | Kshitij '15
Nov, 2014	**1st Position**	National autonomous robotics event | NSSC '14
Nov, 2014	**Top 7 team**	Campus crown round | Philips Blueprint
June, 2014	**Top 1.4%**	Joint Entrance Examination conducted by IIT
March, 2014	**Top 1.2%**	KVPY Fellowship conducted by IISc
2011	**2nd Position**	Safe Driving System | Regional Science Fair
2010	**Top 10 team**	Eastern India Science Fair | BITM Kolkata

Position of Responsibilities

Student Head (Software)	Aerial Robotics Kharagpur Research Group, IIT Kharagpur
(Jul '16 - Present)	Instrumental in leading the research group of 20 students towards its various goals and guide the software team in multiple different research areas.
Student Coordinator	Technology Robotix Society, IIT Kharagpur
(Jan '16 - Present)	Leading a three tier team of 38 students towards the conduction of national level robotics events in techno-management fest, Kshitij, IIT Kharagpur. Designed an autonomous robotics event based on cryptography and magnetic heading seeker, which saw over 50 national teams in Kshitij 2015.

Media Coverage

- 17 Oct 2016 : **The Times of India** , IIT-Kharagpur students developing fully indigenous drones | Link
  Similar article published in 6+ other national print media.
- 19 Oct 2016 : **Zee News, India** , TV interview on drones for the service of nation.

Updated: November 2, 2017