

Rahul Kumar Namdev

Contact Information

125 NBH,
International Institute of Information Technology,
Hyderabad-500032
Andhra Pradesh, India

Mobile: +91 9951468472
E-mail 1: rahul.4188@gmail.com
E-mail 2: rahul.namdev@research.iiit.ac.in
WWW: http://web.iiit.ac.in/~rahul_namdev

Awards and Achievements

- Stood 1st (**Gold Medalist**) in graduating Electronics and Communication dual degree (B.Tech+MS) batch.
- Featured in **Dean's Research Award List** for an excellent research work during my undergraduate.
- Featured in **Dean's Merit List** in 6th and 8th semester for an excellent academic performance.
- Placed in top 1% out of 350,000 students who appeared for the IIT-JEE.
- Placed in top 0.5% out of 500,000 students who appeared for the All India Engineering Entrance Exam.
- Stood 1st in Yahoo! R&D Hack U 2010 for the project idea Rural area twitter (RAT) organized at IIIT-H, India.

Technical Interests

- Vision for Robotics and Mobile Robotics
- Computer Vision
- Embedded Systems and Automation

Education

International Institute of Information Technology, Hyderabad, India

M.S by Research, Electronics and Communication Engineering

Dec 2012 (expected)

- Thesis Topic: *Multibody Visual SLAM*
- Adviser: Dr. K. Madhava Krishna and Dr. C. V. Jawahar
- Area of Study: Computer Vision, Robotics, Multi View Geometry

International Institute of Information Technology, Hyderabad, India

B.Tech. (Hons.)

May 2011

- Major in Electronics and Communication

Publications

Rahul Kumar Namdev, K. M. Krishna and C. V. Jawahar. Multibody VSLAM with Relative Scale Solution for Curvilinear Motion Reconstruction. *International Conference on Robotics and Automation (ICRA)*, 2013. Accepted.

Rahul Kumar Namdev, Abhijit Kundu, K. M. Krishna and C. V. Jawahar. Motion Segmentation of Multiple Objects from a Freely Moving Monocular Camera. *International Conference on Robotics and Automation (ICRA)*, 2012.

Arun Kumar Singh, Rahul Kumar Namdev, Vijay Eathakota and K. M. Krishna. A Novel Compliant Rover for all Terrain Navigation. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.

Rahul Kumar Namdev. A Research Platform for Kondo KHR-3HV Humanoid Robot. *Waseda University Tokyo*, 2010. (Technical Report)

Internships

Research Platform for Humanoid Robot KHR-3HV

May-July 2010

- Developed a fully integrated wireless research platform including hardware, firmware, and software.
- This software controlled 24 serial servos.
- It provided 18 degrees of freedom to the KHR-3HV humanoid robot.

Technical Environment : DSPIC and Renesas Micro-controllers, Humanoid KHR-3HV, Visual C++

Advisor: Dr. Shuji Hashimoto (Vice President, Waseda University Tokyo)

Implementation of four wheeled active suspension rover

Aug-Dec 2009

- Implemented a four wheeled active suspension rover with minimal actuation.
- The suspension mechanism was derived from a planar four bar mechanism and required two actuators to control the internal configuration of the rover.
- This work was published in IROS 2010.

Technical Environment : Nastran Simulation Software, ATMEL Micro-controllers, C++, AHRs

Advisor: Dr. K. Madhava Krishna (Robotics research Lab, IIT-Hyderabad)

Major Projects

Multibody Visual SLAM

- Developed a practical Visual Simultaneous Localization and Mapping (VSLAM) system for a highly dynamic environment. Multibody Structure from Motion (SfM) approach was adopted, which is a generalization of classical SfM to dynamic scenes with multiple rigidly moving objects.
- Proposed an efficient solution of relative scale problem in a multibody VSLAM framework for reconstructing moving objects and stationary world in a unified common scale.
- A unified dynamic 3D map of scene involving multiple moving objects, structure of 3d world, camera trajectory and trajectory of moving objects is the output of our system.
- A part of this work has been recently communicated to ICRA-2013, CVPR-2013.

Technical Environment : C++, OpenGL, OpenCV, Eigen, Lapack, MRPT

Advisor: Dr. K. Madhava Krishna and Dr. C.V. Jawahar

Motion segmentation of multiple moving object from a moving monocular camera

- Developed an incremental system for efficient dense motion segmentation of multiple moving objects from a moving monocular camera.
- Multiple cues based on motion vectors from dense optical flow, motion clues based on multi-view geometry framework was used to achieve dense segmentation of moving objects.
- This work was accepted for publication in ICRA, 2012

Technical Environment : MATLAB, C++, OpenCV

Advisor: Dr. K. Madhava Krishna and Dr. C.V. Jawahar

Micro Line follower and obstacle avoiding Robot

- Build a tiny line following Robot.
- Two micro-controllers were used, one for sensory feedback and other for motion and path planning.
- USART and I2C protocol communication were used.

Technical Environment : C++, ATMEL Micro-controllers, Sonars and few other sensors

Advisor: Dr. K. M. Krishna

Multi Robot Formation Control

- This system comprises of a leader, which is an autonomous obstacle avoiding robot, and other bots which follows the leader by maintaining an IR communication link.
- Ultrasonic sensors are used to detect obstacles.

Technical Environment : C++, Atmel Micro-controllers, Sonar Sensor, IR Sensors

Advisor: Dr. K Madhava Krishna

Other Projects

- Established an ad-hoc network of Xbee RF communication module.

- Developed a distance measurement scheme between obstacle and bot using ultrasonic.
- AutoHome (OpenMoko): Various electronics devices were controlled from cell phone.
- Implemented a modulation identification algorithm for identifying M-ary shift keying using wavelet transform and higher order statistical moments.
- Developed a robotic arm using multiple servo motors and Atmel microcontrollers
- Implemented a pipelined JPEG Encoder using the JPEG standard

Teaching Assistant

- | | |
|---------------------------------------|---------------------|
| • Digital Logic and Processors course | Aug-Dec 2009 |
| • Electronic Workshop-1 | Jan-May 2010 |
| • Digital Logic and Processors course | Aug-Dec 2010 |
| • Electronic Workshop-1 | Jan-May 2011 |

Technical Skills & Expertise

Operating Systems: GNU/Linux , Windows

Programming Languages: C,C++, OpenGL, QT, OpenCV

Hardware Description Language: Verilog (advanced)

Assembly Languages and Microcontrollers: MIPS, INTEL 8086, INTEL 8085, MICROCHIP, ATMEL, DISPIC, Renesas, Beagle Board, Hawk Board

Mathematical Tools: Matlab, Eigen, TooN, LAPACK, BLAS, SuiteSparse

Vision/Robotics Tools: Player-Stage, ROS, Aria, OpenCV, libCVD, VFleat, libSVM

Computer Applications: L^AT_EX, Open Office, Adobe Photoshop, Blender and other common productivity packages for Linux and Windows platforms

Relevant Coursework

Mobile Robotics, Embedded Robotics, Electronics Workshop (I and II), VLSI Design, Pattern Recognition, Computer Programming, Data structures and Algorithms, Microprocessor based system Design, Digital Logic and Processors, Computer Organization, Digital Communication, Information theory and Coding, Signals and Systems, Digital Signal Processing, Probability and Stochastic Processes, Linear Control System, Electromagnetic theory.