# Arunkumar Byravan
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## EDUCATION:

**University of Pennsylvania, 2009 – 2011**
Master of Science in Mechanical Engineering & Applied Mechanics, **GPA: 3.97/4.00**, Advisor: Dr. Daniel Koditschek
**Anna University, Chennai, 2005 – 2009**
Bachelor of Engineering in Mechanical Engineering, **GPA: 8.82/10.00**

## PUBLICATIONS:

A. Byravan, S. Revzen and D. Koditschek, "**A Robust Visual Compass for Highly Dynamic Legged Robots in Indoor and Urban Environments**", submitted to the IEEE *International Conference on Robotics and Automation*, *2012*

A. Byravan, A. Caliskan, J. Cleveland, D. Gilles, J. Kapadia, T. Peerasathien, B. Sankaran and A. Tozzo, **"ENVOY: Exploration and Navigation Vehicle for geology, University of Pennsylvania's Entry in the RASC-AL Robo-Ops Challenge",** *RASC-AL Robo-Ops, 2011* [Authors listed in alphabetical order]

## RESEARCH EXPERIENCE:

**Research Assistant to Dr. Daniel Koditschek & Dr. Shai Revzen, Kodlab, Univ. of Pennsylvania (May '10 – Sep '11)**
*Visual Compass for orientation estimation:*
- Monocular fisheye camera on a dynamic legged robot; Vanishing points in indoor & urban environments
*Energy efficient gaits for turning in place:*
- Parametric gait for 5 – 70 degree turns; Automatic tuning of parameters using VICON and power feedback
*Fisheye camera calibration:*
- Calibration routine for recovery of camera parameters with a new lens projection & distortion model

**Research Assistant to Dr. Mark Yim, GRASP Lab, Univ. of Pennsylvania (Jan – Apr '11)**
*NASA's RASC-AL Robo-ops challenge:*
- Design of rover with 4 DOF arm; GUI, control architecture and autonomous navigation framework

## TEACHING EXPERIENCE:

**Teaching Assistant to Dr. Jonathan Fiene, MEAM 420/520 – Robotics and Automation (Jan – May '11)**
- Devised and proctored projects, held TA sessions and graded assignments for a course on manipulator control, path planning, map building and obstacle avoidance, with a strength of 50 students

## INDUSTRY EXPERIENCE:

**Associate Manager – Product Supply, Procter & Gamble, Baddi, India (Sep '11 – present)**
- Project Manager and Lead Technical Engineer responsible for conception, funding and execution of expansion projects related to all Pantene and Head & Shoulders sachet packing capacity in India

**Intern, Larsen & Toubro Limited, Pondicherry, India (Jul – Aug '08)**
- Identified bottlenecks in the production of L-angle brackets used in transmission line towers with a detailed time value analysis of the product flow, proposing alternatives to optimize production

## OTHER PROJECTS:

**SLAM for a mobile robot (Feb – Apr '11):**
- Data integration from Kinect, IMU, LIDAR and encoders; 2D occupancy grid map and 3D visualizations

**Planning paths for a mobile robot with a complex body structure (Mar – May '10):**
- ARA* planner; Costs a function of footprint collisions at discrete elevations; Static environments; PR2, ROS

**Autonomous robot arm capable of color detection (Dec '08 – May '09):**
- Led a team of five; Design & fabrication of 5 DOF arm; Microcontroller interface, control & vision software

**Misc:**
- Graph Search & Consensus based flocking algorithms, Learning planning costs, Color classification, Autonomous hockey playing robots, Balancing Robot and Line Followers

## SOFTWARE:

Linux, Windows, ROS, C/C++, MATLAB, Python, Maple, Coriander, Gazebo, Solidworks, AutoCAD, ANSYS, Fluent

## HONOURS AND ACTIVITIES:

- Awarded $10,000 to build a rover for NASA's RASC-AL Robo-ops competition
- Recipient of the IA&AD Benevolent Fund for academic excellence in undergraduate study
- Led a team of fifteen in my senior year to organize "Alcatraz," an event that challenged participants to escape from a prison setting using technical skills. Received special mention in "The Hindu"
- Practised the violin for nine years, performing on stage and television