

Manish Saroya

Senior Undergraduate, Department of Electrical and Electronics Engineering
Visvesvaraya National Institute of Technology(VNIT), Nagpur, India
<http://www.ivlabs.in/>
manishsaroya@gmail.com | +91-959.4077.921

EDUCATION

VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY

B.TECH IN ELECTRICAL AND ELECTRONICS ENGINEERING
Expected May 2016 | Nagpur, India
Cum. GPA: 7.16/10.0

PACE JUNIOR SCIENCE COLLEGE

Grad. May 2012 | mumbai, India
Higher Secondary XII, Maharashtra State Board:mumbai, India
Aggregate: 80.0%
Secondary XII, Maharashtra State Board: mumbai, India
Aggregate: 87.67%

LINKS

Research Lab:// [ivlabs](#)
Github:// [manishsaroya](#)
LinkedIn:// [manishlinked](#)

RESEARCH INTERESTS

Controls
Artificial Intelligence
Multi-Agent Systems
Motion/Path Planning
Mobile Robots
Field Robotics

TECHNICAL SKILLS

- Motion/Path planning
- Advance level Ubuntu user
- C/C++, Python, Cython, \LaTeX
- MATLAB programming and SIMULINK
- Deep knowledge of ROS
- Gazebo
- Actuator Control viz. Dynamixel, servo, stepper motors
- Hands on Development Boards
- Image processing with OpenCV

RESEARCH EXPERIENCE

RE-CONFIGURABLE MODULAR SPHERICAL SNAKE ROBOT | AT IVLABS | TO BE SUBMITTED IN IROS 2016

Sept 2015 – Present | Mentor: Dr. Shital S. Chiddarwar | VNIT Nagpur, INDIA

- Working on development of snake robot consisting mechanically connected multiple spherical bots.
- Design eliminates the problems with existing snake robots to handle lateral motions and complex gait analysis by leveraging Omni directional motion capabilities of spherical bots.
- Each spherical module works on the barycenter offset principle with Two driving units incorporating Omnidirectional motion: a) For propelling the robot forward. b) For steering the propeller unit.

MULTI AGENT PATH PLANNING | CARNEGIE MELLON UNIVERSITY | BIOROBOTICS LAB| RESEARCH INTERN

May 2015 – Aug 2015 | Mentor: Prof. Howie Choset

- Design a controller which provides smooth velocity vectors which reduces the cost of travel and also smoothen the path on which the robot has to travel.
- The vector field is more center pointing which helps the robot to be in domain of the controller. The optimization criteria is first go towards the center of the controller then move towards the exit facet.

DESIGN, FABRICATION AND CONTROL OF 'SWAYAT' A 20 DOF HUMANOID (KID SIZE): | AT IVLABS | VNIT NAGPUR, INDIA

August 2014 – January 2015 | Mentor: Dr. Shital S. Chiddarwar

- **Fabrication and Mechanical Design:** It was Designed and Simulated in SolidWorks.Parts are fabricated in CNC Milling. Some small part are 3D printed for more precision.
- **Software Architecture:** Complete Software Architecture was developed on Ubuntu 12.04 using ROS Groovy platform. Multiple nodal communication was done using ROS platform for data transfer. Rosserial was used to communicate with hardware.
- **Control system:** The kinematics for the static walking for the humanoid robot was successfully implemented. Torque and speed feedbacks were taken from the Dynamixel motors.

SNAKE ROBOT | AT UMIC IITBOMBAY | RESEARCH INTERN DEMO VIDEO

May 2014 – July 2014 | Mentor:Prof. S.N. Merchant

- A completely ROS (Robot Operating System) controlled robot, made by using AX-12(advanced servo motors) actuators.
- Tree climbing was tried on the robot by reducing the individual weights of the links. All the basic snake motion gaits were applied successfully.
- GUI for snake control: To make our robot user friendly we built a GUI (Graphic user interface).Using this GUI user can directly run gait of his choice.

- Development Boards(BeagleBone Black, Raspberry Pie, Arduino, Atmega)
- Kinect ROS interface
- 3D printing

COURSEWORK

UNDERGRADUATE

Advance Engineering Mathematics
 Integral Transforms & Partial Differential Equations
 Control Systems
 Advance Control Systems
 Signals And Systems
 Advance Programming
 Microprocessor and linear Electronic Circuits

OTHER ONLINE COURSES

- Linear Algebra by **Prof. Gilbert Strang** (MIT-OCW)
- Artificial Intelligence for Robotics by **Prof. Sebastian Thrun** (Udacity)
- Control of Mobile Robot by **Dr. Magnus Egerstedt** (Coursera)

Present

- Aerial Robotics by Prof. Vijay Kumar(Coursera)

BUTLER ROBOT | TEXAS INSTRUMENTS INNOVATION CHALLENGE 2014

May 2013 – July 2013 | Mentor: Dr.K.M.Bhurchandi

- A self-contained system consisting of Beagle Bone Black , Pico Projector , Tiva C-series launch pad , LiPo battery. Navigation is made with the help of android application device using the values accelerometer as per the orientation and tilt with respect to ground.
- Developed a software architecture on Ubuntu 12.04 using ROS Groovy. Image transportation from BeagleBoard-xM to other systems and vice versa for Telepresence.
- Omni wheels are used rather than normal wheels to achieve Omni bidirectional navigation. Power screw mechanism is used to change the height of the top for the convenience of the user.

AWARDS AND ACCOMPLISHMENTS

- **Selected for 2nd round of Texas Instruments Analog Design Contest 2014**, amongst 400+ teams.
- **Establishment of IVLABS at VNIT** along with my colleagues to spread the awareness of robotics and automation and increase the interest of the people in the same field.
- **Currently Core coordinator of IVLABS** and mentoring sophomore year students in projects like **Home Navigation type Bulter Robot & kid size Humanoid robot**.
- Have worked with Rohan Thakker(Graduate student at **Carnegie Mellon University**) on Home Navigation Butler Robot.
- Conducted number of technical workshops on **basic concepts of robotics, ROS, Basic Development Boards** for freshman year students at VNIT Nagpur.
- Active committee member of **IEEE Student Chapter** at VNIT Nagpur.