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Academic Awards and Achievements

2014 Trained PR2-robot developer, CARIS lab, UBC Vancouver
2014 Globalink Research Internship -MITACS, CANADA (accepted)
2014 VIT University Innovation Team Award - Creation Labs
2014 Summer Research Fellowship at Indian Institute of Science (IISc), Bangalore (declined)
2014 VIT University, Special Achiever's award
2014 Invited Participant (representing the country) for Grand Hack fest, MIT Media Lab, Boston
2014 Runner up at the CAMTech hack-a-thon, Kolkata- Jugaadathon
2014 India's first Maker Fest, Motwani Jadeja Family Foundation - Invited Presentation
2013 Awarded First Prize in Instructables, Build My Lab Contest-Tekla Labs
2013 Committee award in CAMTECH Hack-a-thon, UGANDA
2013 Selected participant for MIT Media Lab India Initiative Workshop, Camera Culture Group
2013 Best Innovation award in CAMTECH Hack-a-thon, INDIA
2013 University Merit Scholarship Award
2012 University Merit Scholarship Award

Education

- B. Tech Mechanical Engineering, VIT University; CGPA - 9.16/10, till pre-final year
  - Rank: 20th out of 414 students [2011-present]

Technical Work Experience

- **University of British Columbia**
  Dr. Ian M Mitchell's Collaborative Robotics Research group Assistant
  at Laboratory of Computational Intelligence, LCI [June to September 2014]
  - Research Affiliate [September'14 to present]
  - Project goal: Designing a behavioral model for the indoor navigation of smart powered wheelchair, specifically for the back-in parking task.
  - Validated several authored SLAM techniques for indoor navigation
  - Developed a new SLAM algorithm for indoor navigation (C++ and ROS)
  - Extensively used the point cloud library features, published the same for ROS hydro
  - Focused work on probabilistic techniques for designing a dynamic map
  - ❖ **Canadian Wheelchair (CanWheel) Project**
  - Wizard-of-Oz (collaborative shared control policy) user trials - scene reconstruction
  - Developed the pipeline for visualizing the rosbags (8 Tb) data (Python and ROS)
  - Redefined the transforms: sensors data types odometry, laserscan, rgb-d, imu, joystick
  - Sensor data validation and scene reconstruction
- **University of British Columbia**
  Computer vision researcher in th**e** PR2 robot project at CARIS lab [July to September 2014]
  - Human to robot handover experiment
  - Worked on Point Cloud Library (3D perception) and ROS (C++ and ROS)
  - Studied various object detection techniques to define the point of grasp
  - Worked on skeletal tracking, object detection, segmentation, pose estimation
  - Human –human handover study (conducted in Oct'14)
- **Creation Labs, VIT University**
  Capstone project supervised by Dr. Ian M Mitchell [September 2014 to present]
  - Extension of the work done on smart wheelchair project
  - Working on tele-operation features
  - Developed a visual information matrix, can be transmitted wirelessly
- **Glocal Healthcare Systems Private Ltd.**
  Product Design and Research Intern at Glocal MedTech, (GHSPL, India) [Summer, 2013]
  - Primary Project: A novel low cost digital microscope for pathology clinics in LMICs
  - Designed the new portable microscope which can be rapid prototyped (3D print)
  - Used off-the shelf linear actuators (DVD drives)
  - Mathematically modelled the sequence for motion actuation (arduino and C++)
  - Developed the electronic circuit for precise motor control
  - Designed the embedded system software, freely available under BSD license

- **Centre for innovation and development, VIT University** **Teaching Assistant 2013**
    - Design thinking process (INV201)- Tutored 13 students (3 teams)
        - Assisted in hardware design and documentation, http://i4d.mit.edu/
        - Held daily office hours and managed inventory

Certificate Courses

- Communication With Impact and Productive team Strategies, MITACS Globalink Workshop
- Ethical Conduct for Research Involving Humans, Course on Research Ethics (TCPS 2: CORE)
- Aakash android application programming by ISTE, IIT Bombay, MHRD- Govt. of India

Soft Skills

- OS: Windows, Linux, Robot Operating System(ROS) - developer proficiency
- Language: C, Java, C++, Python (developer Proficiency), Version Control (Git)
- Developing Environment for Embedded systems: MATLAB and Arduino
- CAD - SolidWorks, ANSYS, NI Multisim

Technical Projects

- **Robot Operating System - wiki update (tutorials and documentation)** [2014]
    - Implemented and published Point cloud library tutorials for ROS-hydro version
- **Mechanical and Metallurgical Characterization of stainless steel** [Dec'13 to Sept'14]
    - Comparative assessment on the influence of 2209 and 2553 filler wires on the microstructural and mechanical properties of GTA and PC-GTA welded 2205 duplex stainless steel plates.
- **Demonstrated an effective and affordable audio tactile hearing aids for the deaf**
    - Course project for the "Innovation for Development", INV201 [Dec'12 to Oct'13]
        - Project in collaboration with The Worth Trust, school of deaf and hearing impaired
- **To investigate the heat & phases transfer on thermal arrest time in the sand casting process**
    - 2D simulation to understand and describe the casting process by using volume of fluid (VOF) model integration with the solidification model in Fluent

Non-Science Work Experience

- Globalink Student Ambassador, MITACS 2014
- Co - lead and Co- founded Creation Labs, VIT University 2012
- Curated: Creation Lab expo 2014
- Organized inter-university hack-a-thons, i4D 2013 and #Wehack 2014
- Student Representative, Centre for Innovation and Development [2012-2013]

Extra-Curricular Projects

- Designed and tested a White noise cancellation device addressing the "ringing" sound for people suffering with tinnitus, CAMTech Grand Hackfest, MIT, USA March 2014
- Quantitative assessment for progress of nuclear cataract in Indian adults (>45 years) Jan'2014
    - Designed an image capture device to store the data on a server for post assessment
- Low cost neonatal incubator, CAMTECH hack-a-thon, UGANDA August 2013
- A novel magnification device to assist school going children challenged by macular degeneration, Camera Culture group, MIT-Media Lab India initiative summer 2013
- Low cost vein finder for use in emergency and critical care, GLOCAL Healthcare summer 2013
- Oxygen mask enhancements, one of which is to understand respiration trends to provide vital information for paramedics and doctors, CAMTECH hack-a-thon, INDIA March 2013

Media and Speaking Experience

- Speaker at Maker fest'14 - telecasted on National TV, Project: Audio tactile speech aids
- Live Radio interview about MITACS and experience in CANADA @ Sher-E-Punjab station.
- AUGUST 2, 2014: Vancouver Sun, Technology blog **"**UBC smart wheelchair";
  Vancouver Desi, "UBC student from India designing smart wheelchair that can park itself"
- July 27th, 2014: Indo-Canadian Voice newspaper, British Columbia Edition "MITACS Globalink program attracts the brightest minds to Canada, including Karthik Paga from India"

Interests and Hobbies

- Society Membership: ASME and IEEE
- Reading (Biography and Mystery), sports, hiking and kayaking