Prasanna Venkatesan Kettavarapalyam Sriganesh

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OBJECTIVE

To secure an admit into the Doctoral program in Robotics at the Robotics Institute, Carnegie Mellon University, and conduct research in the field of legged locomotion and motion planning.

EDUCATION

B.Tech. – PES University   **Aug 2019**
  Electronics and Communication Engineering (Major), CGPA: 9.48/10, *Rank: 10 out of 325 (Gold Medalist)*
  Computer Science Engineering (Minor), CGPA: 9/10
  Coursework: Control Systems, Machine Learning, Digital Image Processing, Artificial Neural Networks,
          Microcontrollers, Data Structures, Design of Algorithms

12th Grade – Nandi P.U College   97%   **May 2015**
10th Grade – Nandi High School   95.2%   **March 2013**

RESEARCH EXPERIENCE

Undergraduate Research as Elective, PES University   **August-December 2018**
- Designed an array of ultrasonic range sensors to be used as a low-cost substitute lidar for SLAM
- Successfully perform SLAM with good accuracy using ultrasonic sensor array

Research Mentor, Microsoft Innovation Lab   **June-July 2018**
- Guided two intern teams working in the field of mobile robotics and conducted research.
- Implemented a ball-catching algorithm in a robotic arm using trajectory prediction from video stream.
- Guided a team to extend a previous 2D SLAM approach into a visual 3D SLAM implementation

Research Intern, Microsoft Innovation Lab   **June-July 2017**
- Built a robot named 'Explodroid' equipped with Xbox Kinect and Intel NUC® to perform SLAM.
- Successfully implemented gmapping package and performed SLAM using ROS
- Performed autonomous navigation on an existing map using Adaptive Monte Carlo Localization

PUBLICATIONS

- Prasanna Venkatesan K S and Prajwal Rajendra Mahendrakar, "Generating curved path walking gaits for biped robots with deficient degrees of freedom", *in Proc. 2021 IEEE/SICE International Symposium on System Integration(SII)*, Iwaki, Fukushima, Japan, 11th-14th January 2021, pp. 786-793
- Prasanna Venkatesan K S, Prajwal Rajendra Mahendrakar and Rajasekar Mohan, "Solving inverse kinematics using geometric analysis for gait generation in small-sized humanoid robots," *in Proc. IEEE/SICE International Symposium on System Integration(SII),* Honolulu, Hawaii, USA, 12th-15th January 2020, pp. 384–389
- Prasanna Venkatesan, N. Pavitra, and Rajasekar Mohan, "Performing SLAM using Low-Cost Sensors for Autonomous Navigation in household environments*", 2019 IEEE 5th International Conference for Convergence in Technology (I2CT)*, Pune, India, 2019

WORK EXPERIENCE

Software Engineer, Cisco Systems Ltd.   **August 2019-present**
- Developed feature enhancements in Java to standardize Rest-APIs for an automated Network Compliance Check software
- Design automation scripts to benchmark timings and implement solutions for performance improvements

Intern, Honeywell Technology Solutions Lab Ltd.   **February-June 2019**
- Verified different independent real-time operating system (RTOS) components like memory unit etc. on an ARM processor
- Deployment of boot OS on hardware to test functionality of a mission critical real-time operating system (RTOS) used in aviation.

ACHIEVEMENTS and AWARDS

- Awarded the Prof. C N R Rao Scholarship for all the 7 semesters of the B.Tech. course
- Awarded the Prof. M R Doreswamy Scholarship during the first two semesters of B.Tech.
- Won 1st prize in the Cisco-RVCE hackathon 2018 conducted at RV college of Engineering
- Regional finalist in the e-Yantra robotics competition conducted by the Indian Institute of Technology, Bombay
- Won 1st prize in poster presentation for the undergraduate project work.
- Secured 1st prize in the Cisco Systems internal hackathon – HackIT.
- Core member of the Microsoft Innovation Lab, PES University.
- Runner-up in PES University's Science Expo for showcase of Hexapod Robot.

UNDERGRADUATE PROJECT

TONY Humanoid Robot – 17 DOF small-sized humanoid platform for research   **January 2019-May 2019**
- 17 Degrees of Freedom in total – 5 per leg, 3 per arm, 1 in neck.
- 30 centimeters in height, works using Bluetooth serial communication
- Devised an independent Inverse Kinematics solution based on geometric approach

ACADEMIC PROJECTS

Predicting the grasps of an object for Robot Arm using RGB-D image   **March 2018-May 2018**
- Predicted grasp locations of objects like spoon, bottle, calculator etc. using RGB-D images
- Tested using different supervised learning models like regression, feed forward neural networks and support vector machine
- Regression model had highest accuracy of 89%, support vector machine had accuracy of 84%

Biometric Recognition using Iris segmentation and Template Matching   **April 2018-May 2018**
- Captured and extracted iris of an eye using near infrared images, segmentation performed using Hough transform
- Encoded the iris using 1-D Gabor filters to be stored in database
- Ensured no false positives in recognition by using hamming distance for template matching

INDEPENDENT PROJECTS

Non-Intrusive Sleep monitoring system using In-Ear Electro Encephalogram (EEG)   **October 2018**
- Captured In-ear brainwaves for monitoring sleep through designed memory foam-based electrodes.
- Classified collected data into different sleep cycles and accurately predict current sleep cycle
- Diagnose different disorders from the data collected via a portal collaborated by medical practitioners.

Autonomous pick and place robot by using third-person camera stream   **January- March 2018**
- Developed an algorithm to identify objects and goal positions via overhead RGB camera.
- Autonomously control a robot to pick and navigate to the goal point for drop-off
- Solution implemented on the FireBird-V mobile robot platform

Retrofit Home Automation controller as low-cost Home automation substitute   **September-October 2017**
- Invented a retrofit device capable of togging electric switches manually without use of relays
- Control of system using Ai chat assistant like Google Assistant, with basic setup

The Scripting Arm – Robotic arm to write text in handwritten form   **January-March 2017**
- Designed a robot arm with 2 translational axes with precise control in millimeter range.
- The arm was capable of writing alphabets and print pictures using the G-code CNC format.
- Processed digital text into a vector images using pre-decided pattern to be sent as G-code

Automated robotic arm for collecting and dumping objects in given workspace   **April-May 2016**
- Built robotic arm with 3 rotational degrees of freedom with a semi-sphere workspace
- Detect object using an ultrasonic sonic sensor mounted to the base
- Calculated joint angles using basic inverse kinematic solutions for 2-link robot arm

Hexapod robot based on tripod gait   **March 2016**
- Built a hexapod robot with simple 3-actuator tripod gait for walking and turning in place
- Modeled an ultrasonic sensor array to provide information about entire surroundings
- Achieve occupancy grid mapping using inputs from sensor array on an Arduino microcontroller.

CR4 – A remote controlled cleaning robot inspired by Wall-E   **January-May 2015**
- Built a robot using basic Arduino remote control to sweep the floor
- Remote control achieved through RF communication using PlayStation controller.

MINI PROJECTS

Implementation of a Basic 12-bit Microcontroller using Verilog   **May 2018**
- Designed and Implemented a 12-bit microcontroller with 16 OP codes, 2 registers with ALU using Verilog

Implementation of 'FREE" command in XV6 Operating system   **December 2017**
- Implemented the linux 'free' command on XV6 (vanilla OS made by MIT) to show status of free memory.

Command Line Music player using C   **December 2016**
- Designed and implemented a command line music player using concepts of doubly linked lists and the winmm api to play music, create playlists etc.

EXTRACURRICULARS

- Astronomy and Astrophotography hobbyist and conducted eclipse watch parties for regional science center.
- Participated in 'Life in Space workshop' conducted by Indian Astrobiology Research Center, Mumbai - 2019.
- Completed three 10km marathons in 2016, 2017 and 2018 for social cause and upliftment of martyr families.
- Organized ideathons and hackathons like #code and Incito as part of the Microsoft Innovation Lab