Anand Parwal

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OBJECTIVE

Seeking co-op/internship opportunities starting January 2018 for research-oriented robotics engineering position.

EDUCATION

Worcester Polytechnic Institute (WPI), Worcester, MA, USA
Master of Science, Robotics Engineering, GPA 3.75/4, May 2018
Relevant courses: Artificial Intelligence, Biomedical Robotics, Motion Planning, Robot Controls, Robot Dynamics, Deep Learning for Advanced Robot Navigation, Swarm Intelligence*

Birla Institute of Technology and Science, Pilani, India
Bachelors of Engineering (Honors), Mechanical Engineering, GPA: 8.26/10, May 2016
Relevant courses: Intro to Robotics, Mechatronics, Nonlinear Vibrations, Machine Learning, Intro to MEMS, Object Oriented Programming and Design, Pattern Recognition, CAD

SKILLS

Programming: Linux, C, C++, Python, MATLAB
API's and libraries: Tensorflow, Keras, Sklearn, OpenCV, Scipy, git, ROS, Gazebo, OpenRAVE, Xabsl
Software: Solidworks, Autodesk Inventor, ANSYS, OpenSim

EXPERIENCE

Research & Development Intern | Delsys Inc. | Natick, MA, USA | May-Aug 2017

- Developed algorithms to detect the severity of symptoms of Parkinson's disease patients using machine learning on data from proprietary wearable sensors (EMG and IMU).

PROJECTS

Monaural Source Separation using Recurrent Neural Network | WPI | Aug-Dec 2017
(under Carlos Morato, Professor, Robotics Engineering, WPI)

- Developed and implemented a recurring neural network to separate two speech sources and music/vocals from mixture of audio inputs (cocktail party problem)
- Developed using custom keras/tensorflow time-frequency masking layers

Pedestrian Detection using Convolution Neural Network | WPI | Aug-Dec 2017
(under Carlos Morato, Professor, Robotics Engineering, WPI)

- Developed and implemented a convolution neural network to detect pedestrian bounding boxes using weak supervision in 2D images. Developed using keras/tensorflow

Motion Compensation using da Vinci surgical robot | Automation and Interventional Medicine Lab, WPI | Aug-Dec 2016 (under Gregory Fischer, Professor, Robotics Engineering, WPI)

- Developed and implemented autonomous motion compensation algorithm on a da Vinci Surgical robot using ROS and Gazebo for organ motion during surgeries

Motion Planning for Manipulating Deformable Objects without Modelling | Motion Planning course project, WPI | Jan-Apr 2017

- Developing, implemented and tested a novel motion planning algorithm to manipulate deformable objects without expensive modeling or simulating deformation

Soft, Passive Exoskeleton for Augmenting Lower Body Motion | Robot Dynamics course project,

WPI | Jan-Apr 2017 (under Gregory Fischer, Professor, Robotics Engineering, WPI)

- Designed, analyzed and prototyped a proof-of-concept passive exo-suit to enhance users' running and walking performance. Simulation in OpenSim and MATLAB, prototype analysis using Tracker.

Automated Author Profiling | Artificial Intelligence course project, WPI | Aug-Dec 2016
(under Dimitri Korkin, Professor, Computer Science, WPI)

- Developed an author profiling system for predicting authors' age, sex, and genre of novels using tf-idf and POS tagging for feature extraction and compared performance of various classifiers.

NASA Space Robotics Challenge Qualifying Round | Team WHRL, WPI | Sept-Feb 2016

- Developed code for tasks like detecting and then locating light sources of for simulated R5 robot in an agile development environment using C++ and OpenCV with 40 members

In-charge | **Project AcYut** | Centre for Robotics & Intelligent Systems, BITS Pilani| Jan 2013- May 2015

- Designed, analyzed and fabricated mechanical structure of the humanoid AcYut-7, including use of torsion spring to reduce torque requirements in knee joints. Design using Solidworks and MATLAB
- Implemented walking algorithm LIPM for the humanoid and Goal-keeper behavior of the robot for playing 2 on 2 soccer for RoboCup using XABSL and python
- Managed team funding and coordinated the team of eight students
- Participated in Humanoid Soccer League, RoboCup 2014, Netherlands and awarded i3 appreciation prize in India Innovation Initiative 2015

sEMG controlled Upper Limb Exoskeleton| CRIS, BITS Pilani | Jan - May 2016
(under BK Rout, Professor, Mechanical Engineering, BITS Pilani)

- Designed and prototyped a single DOF, elbow joint, low-cost arm exoskeleton controlled using EMG signals from biceps brachii and joint displacement readings from Dynamixel actuators that could augment rehabilitation of muscles for stroke victims

Human Robot Interaction Platform| CRIS, BITS Pilani | Jan - May 2016
(under BK Rout, Professor, Mechanical Engineering, BITS Pilani)

- Developed a computer vision based framework for shadow motion and collaboration between human workers and industrial robots using crane hand signals to command an ABB 1410 robot using ABB RobotStudio, OpenCV ,and scipy in python.

Project BITS Lifeguard (Identification)| Wearable, Pervasive & Networking Lab| Aug – Nov 2015
(under Rahul Banerjee, Professor, Computer Science and Information Systems, BITS Pilani)

- Implemented an unobtrusive biometric identification using pulse response and bio-impedance in wearable computing devices to be used to detect fatigue in truck drivers

Gesture Control for Internet of Things| CRIS, BITS Pilani | Jan - May 2015
(for MEMS, Mechatronics and Artificial Intelligence course projects)

- Designed and analyzed a MEMS accelerometer and implemented basic gesture recognition algorithms to control IoT enabled devices in the lab.
- Awarded best paper presented at BITS Pilani's Technical Festival Apogee 2015

ADDITIONAL EXPERIENCE

Intern | **Sierra Control** | Mumbai, India | May-July 2015

- Oversaw installation and inspection of automation equipment at multiple client sites and learned firsthand the complexities involved in field versus the theoretical design of automation systems

Intern | **Kirloskar Pneumatic Company Ltd** | Pune, India | May-July 2014

- Improved an existing design of multipoint cutting tool for gear milling and discussed its feasibility with the tool manufacturer and briefed the company on manufacturing feasibility for high-speed

gearboxes in their current workshops

Volunteer | **Lions Club** | Dewas, India | June 2013

- Planned fundraising event for rehabilitation of slum fire victims in Dewas, India
- Constructed and organized, with team of 20 other volunteers, a temporary refuge for the victims