Pankaj Chauhan

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INTERESTS

My interests are in Affective Computing (mainly on Speech emotion Recognition) and Speech processing, and broadly, to solve multimodal AI problems using machine learning techniques.

EDUCATION

Bachelor in Electronics and Telecommunication Engineering, University of Mumbai GPA: 8.13/10 ***June 2014-present***

- Focussed on Affective Computing and Speech Processing and implemented ASER system on MATLAB

SKILLS

Programming languages: C, MATLAB, Java, Python, Lua
Software Packages: MATLAB, Octave, Eagle, Circuit Maker, V-REP
ML tools: skearn, numpy, OpenCV
Miscellaneous: Arduino programming, Video Editing

PROJECTS

Harmony Search for Feature Selection in ASER ***Ongoing***

The main aim of the project is to decrease computation time of Emotion Detection Mechanism by using less possible features while retaining significant accuracy.
Experiments are conducted on the EMODB and IITKGP-SEHSC databases, demonstrating that size of each subset reduced to 50% of the size of original feature set, however, the accuracy remained almost same as original ones

(Tool used: MATLAB)

Speech Emotion Recognition using Dynamic Time Warping ***Jan 2017 - Apr 2017***

The purpose of speech emotion recognition system is to automatically classify speaker's utterances into five emotional states such as disgust, boredom, sadness, neutral, and happiness.
- Designed and built a speech emotion recognition system using SAVEE database on MATLAB
- Developed a trained model for detecting emotion using DTW classifier
- Obtained accuracy of 68.57% **(Tool used: MATLAB)**

Electronic Piano ***July 2016 - Oct 2016***

Built a piano with variable tuning feature using IC 555 in Astable mode.
IC sends high/low-frequency signals to a piezo buzzer based on the value of resistance corresponding to the key/button pressed by the user thus producing the sound of the note.
- Introduced potentiometers to obtain custom octave frequencies.

(Tools used: Eagle, Circuit Maker, IC 555, Resistors, Capacitors, Speaker and Potentiometers)

COMPETITION PROJECTS

Line Follower Robot ***Sept 2015***

Built a line follower robot for a National Robotic Championship Organized by ARK tech in association with IIT Madras held at IIT Bombay.
The Line follower robot is a mobile machine that can detect and follow the line drawn on the floor.
Programmed Arduino to control motors of robot according to map.

Collector Bot ***Nov 2017 - Mar 2018***

This bot is built for Eyantra online robotics competition and my theme was in agriculture domain.
The arena for the theme is an abstraction of a farm with fallen fruits in it. An autonomous robot build from scratch collects the Fresh fruit and avoids the damaged fruit.
Feedback from the overhead camera is processed to direct the robot. Position and nature of the fruits are determined by ArUco markers.The whole arena was redesigned in V-REP simulator and path planning module was scripted in LUA in V-REP, over which the actual bot had to move over the arena.
So simulation of the real life scenario was done inside V-REP and the necessary data to control the motion of bot was sent to it via X-Bee module which works on UART.
Also, the motion of bot was controlled using PID algorithm to make sure bot follows the path created in V-REP simulator.
Further, the robot also has to transfer the fruits into another independent robot which is moving in the farm in a path.

SUMMER TRAINING DETAILS

- **Certificate Course in IP Networking** at *CETTM, Powai* ***July 2017***
- **Short Term Training Program** on "Basic Electrical Testing" at *Syselec Technologies Pvt. Ltd* ***July 2016***

ACHIEVEMENTS AND EXTRA CURRICULAR ACTIVITIES

- Qualified **GATE** in 2018
- **Eyantra online robotics competition:** Reached till a final task of competition.
- **National Robotic Championship Organized by ARK tech in association with IIT Madras:** Zonal winner of Mumbai and Represented SFIT in Finale at IIT Bombay
- **PRAYAS 2015:** Presented Laser Security System along with Colour Recognition Lock.
- **MOSAIC:** Leader of Mosaic (2016) Contraption Team
- Participated in "**3rd National level Technical Paper Presentation**" organized by Universal College of Engineering