VOICE CONTROLLED ROBOTIC ARM

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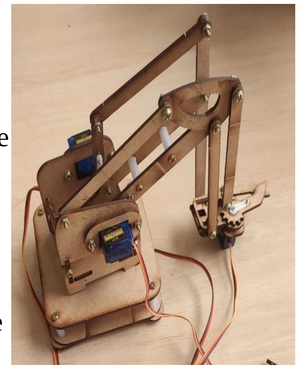
PROBLEM STATEMENT

In our project, We focus on speech recognition and its application to robotic arms. Constructed Robotic arm is lightweight and easily usable and can be controlled using voice input in various regional Languages. The arm will be able to move in any Direction based on the voice instruction Given.

The problem statement focuses on controlling the robotic arm by voice Commands,where the user will be able to give inputs in both English and Kannada languages. Robotic arm can also be controlled using live instructions



BACKGROUND

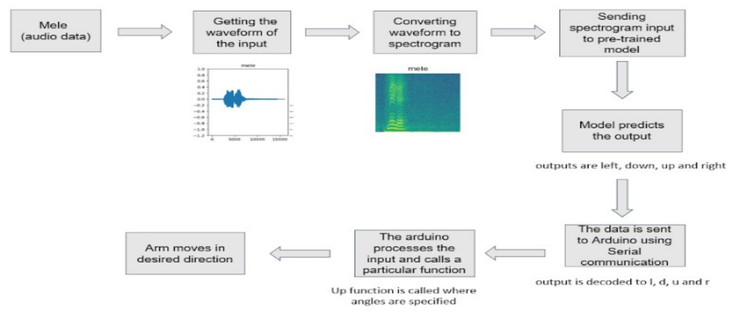
All the existing work was based on English voice instructions and to make it useful for our natives we have included Kannada language instructions also.

DATASET AND FEATURES

The dataset we are using contains audio files in 16 bit pcm. The English dataset we found it in Kaggle which was used to recognize the words, It has four different audio instruction (Up , Left , Right , Down) and Kannada dataset we actually created dataset by collecting audio of different people and then converting it to 16 bit pcm form. The Kannada dataset has four different words (Mele, Kelage , Yadake , Balake).All the pre recorded audio inputs can be used to train data and live voice inputs are given at instant. All the voice inputs are grouped under the label it belongs which is required to test the predictions. All voice data are unique no two voice inputs of same user is present in data.

DESIGN CONSTRAINT

High level design architecture



Design Constraints:

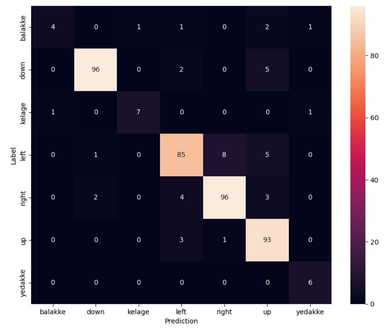
- continuous two instructions cannot be the same
- limited to only very few instructions and that is only in Kannada and English language.
- only single word instructions should be given
- arm will move to given directions from initial position i.e, UP and LEFT
- speed of arm movement and degree of rotation can be changed according to user's requirement.

SUMMARY OF PROJECT OUTCOME

This project deals with robotic arm to which we give instructions in Kannada and English. In this project , we can also give live instructions, which is really useful in this modern day world. We have implemented the CNN model which gives more accurate results than the ANN model. The robotic arm works for 2 Degrees of freedom and can perform basic commands

RESULTS AND DISCUSSIONS

Out of the methods used, Convolution neural network has worked best for us. The accuracy which we got in English commands is 94% and in Kannada dataset 81.67%



CONCLUSION & FUTURE WORK

This particular robotic arm built can be mainly used by farmers with any of other regional languages to pick and place objects and do any repetitive works. Any one without age limit or anyone without prior knowledge will be able to use.

- The arm can be extended to do complex actions like picking up heavy objects
- Can be extended to any regional languages (can be used in military services as enemies won't be able to understand.

REFERENCES

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3.Md. Abdullah Al Ahasan, "Implementation of Speech Recognition Based Robotic System"2011

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