Audio Classification Quadrant Chart

Research Question

Classify daily life activities based on their audio sounds. Some examples of daily life activities that I am trying to classify correctly:

a) Using phone
b)Drinking
c) Clapping
d) WaterPouring
e) Washing Hands
f) Watching TV

Methodology

a) Convert WAV files to numpy array

b) Pre-process audio data (Augmentation, Noise reduction, Trimming)

c) Extract features by applying Short Time Fourier transform

d) Apply 6 layer dense **Neural Networks** with Relu / Softmax
e) Classify

Data Analysis and Results

The NN model is trained with 880 samples, validated on 146 samples. We can see an approx accuracy of about **91-93%** . I have also plotted a confusion matrix to show the prediction for different activities.

Interpretation and Conclusions

a) My model is able to correctly classify almost 90+% of the data making it a good model.

b) However there is scope for improvement by improving parameters for STFT, better preprocessing of data and More layers with better learning rates.