A3 Writeup
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1. We used random forest classifier with param {'min_samples_split': 2, 'n_estimators': 450, 'random_state': 1, 'max_depth': 7, 'min_samples_leaf': 1} by using grid search to find best parameters. On top of formants, pitch and delta features, we also added delta_delta feature. The average over the 10 fold is:
    a. The average accuracy is 0.892139439508
    b. The average precision is [0.94094096 0.74928805 0.9688157 0.91268662]
    c. The average recall is [0.86344683 0.90830369 0.94991352 0.85350743]
2. The data is collected at LGRC library. All of the team members read script for three minutes each. We were holding the microphone close to our mouth as we speak. We tried to speak with normal tone and pitch. There are a few factors that may have an effect on our classifier:
   1) background noise in library,
   2) the pace we speak may vary depends on the difficulty of the words on the script,
   3) we may laugh if there are something funny on the script.
   The three points mentioned above can also be accounted for variation.
3. The ability to identify the speaker can be used to measure the effectiveness of treatments imposed to people with Autism.
4. a) It is not informative enough for large amount of speakers (other speakers may also be using the same vocabulary).
   b) Not all people have a special vocabulary word to use when speaking.
   c) Word recognition must be implemented to support this feature.
   d) Need to store word frequency of speakers. It would require a large amount of data (recording speeches) for the feature to be effective.