

Gender Voice Detection

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Introduction

Gender recognition by voice features is a technique in which you can determine the gender category (Male or Female) of a speaker by processing speech signals.

Gender recognition can be useful in many fields, including automatic speech recognition, in which it can help improve the performance of these systems. It can also be used in categorizing calls by gender, or you can add it as a feature to a virtual assistant that is able to distinguish the talker's gender.

1) Dataset:

This database was created to identify a voice as male or female, based upon acoustic properties (features) of the voice and speech. The dataset consists of 3,168 recorded voice samples, collected from male and female speakers with an analyzed frequency range of 0hz-280hz (human vocal range).

The following acoustic properties (features) of each voice are measured and included within the CSV:

- meanfreq: mean frequency (in kHz)
- sd: standard deviation of frequency
- median: median frequency (in kHz)
- Q25: first quantile (in kHz)
- Q75: third quantile (in kHz)
- IQR: interquantile range (in kHz)
- skew: skewness (see note in specprop description)
- kurt: kurtosis (see note in specprop description)
- sp.ent: spectral entropy
- sfm: spectral flatness
- mode: mode frequency
- centroid: frequency centroid (see specprop)
- peakf: peak frequency (frequency with highest energy)
- meanfun: average of fundamental frequency measured across acoustic signal

- minfun: minimum fundamental frequency measured across acoustic signal
- maxfun: maximum fundamental frequency measured across acoustic signal
- meandom: average of dominant frequency measured across acoustic signal
- mindom: minimum of dominant frequency measured across acoustic signal
- maxdom: maximum of dominant frequency measured across acoustic signal
- dfrange: range of dominant frequency measured across acoustic signal
- modindx: modulation index. Calculated as the accumulated absolute difference between adjacent measurements of fundamental frequencies divided by the frequency range
- label: male or female

2) Random Forest Classifier:

The Random forest or Random Decision Forest is a supervised Machine learning algorithm used for classification, regression, and other tasks using decision trees.

The Random forest classifier creates a set of decision trees from a randomly selected subset of the training set. It is basically a set of decision trees (DT) from a randomly selected subset of the training set and then It collects the votes from different decision trees to decide the final prediction.