



Speech Emotion Interpreter

A tool for the hearing-impaired

David Weon



38,200,000

Approximately 14.3% of Americans report some degree of hearing loss



RAVDESS Audio Identifiers

Emotion

Angry, Disgust, Fear, Happy
Neutral, Sad, Surprise



Actor

Male
Female

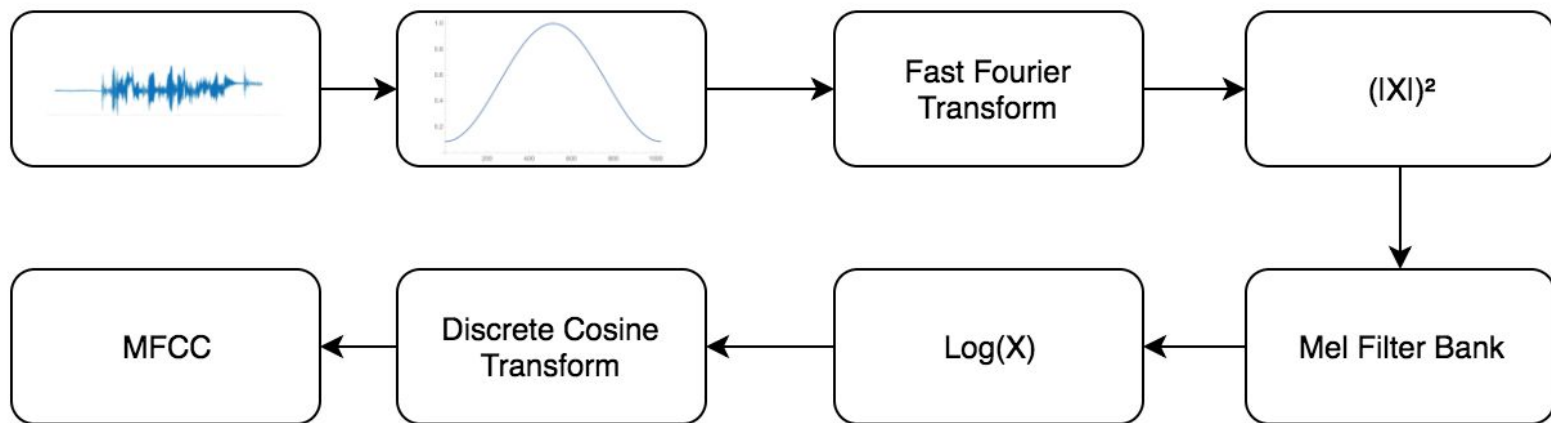
Statement

"Kids are talking by the door"
"Dogs are sitting by the door"





Mel-frequency Cepstral Coefficient (MFCC) Extraction Algorithm

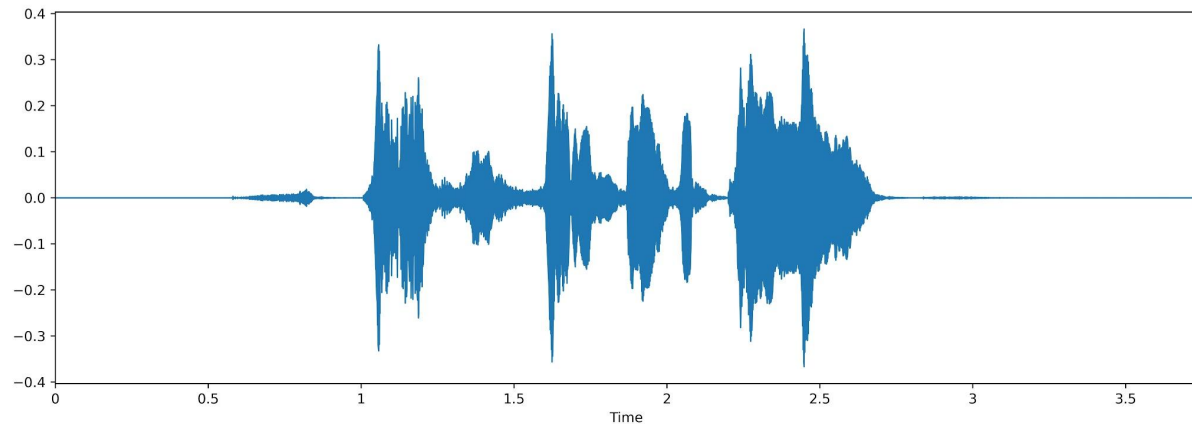




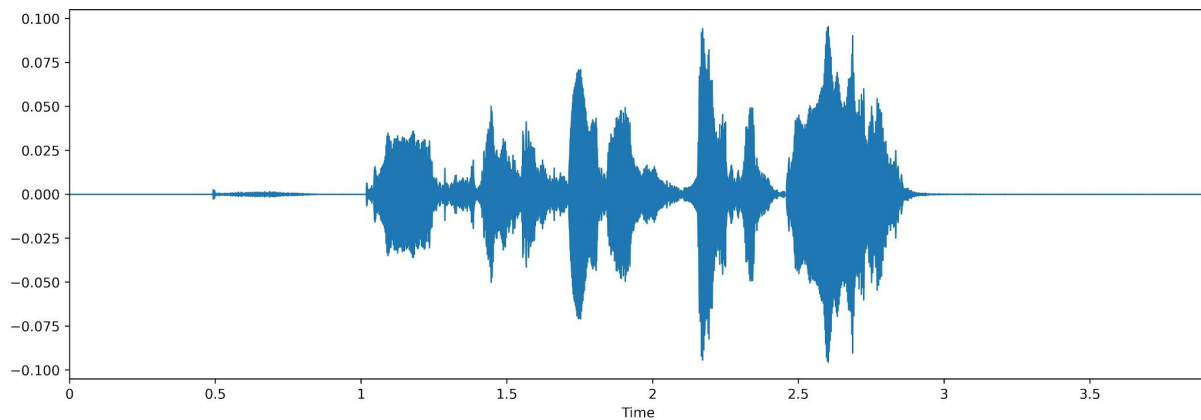
Audio Examples:

“Dogs are sitting by the door”

Female Happy

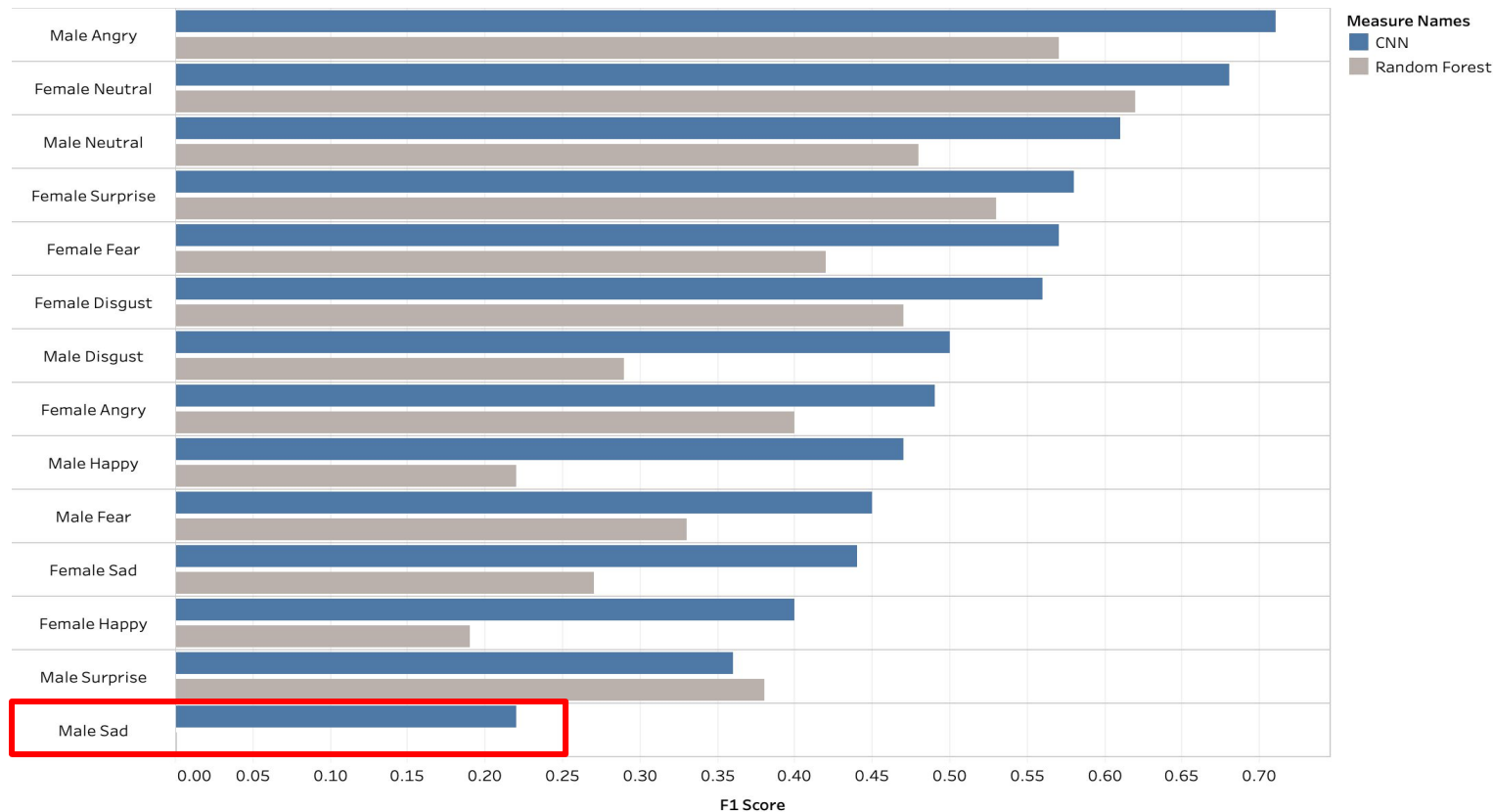


Female Sad



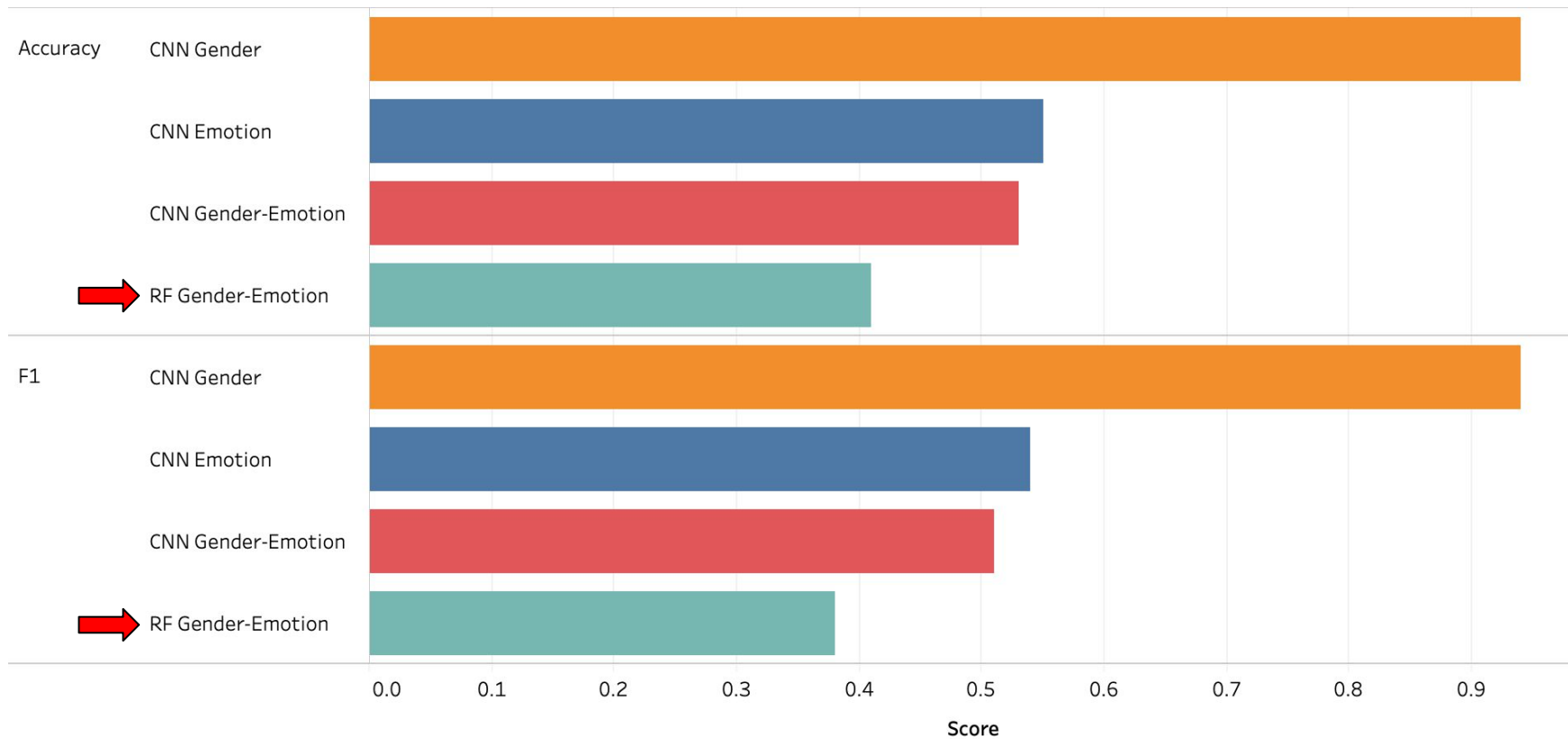


Convolutional neural network outperforms random forest at gender-emotion classification





For speech, gender is easier to classify than emotion





So can this interpreter be trusted?

52.5% accuracy

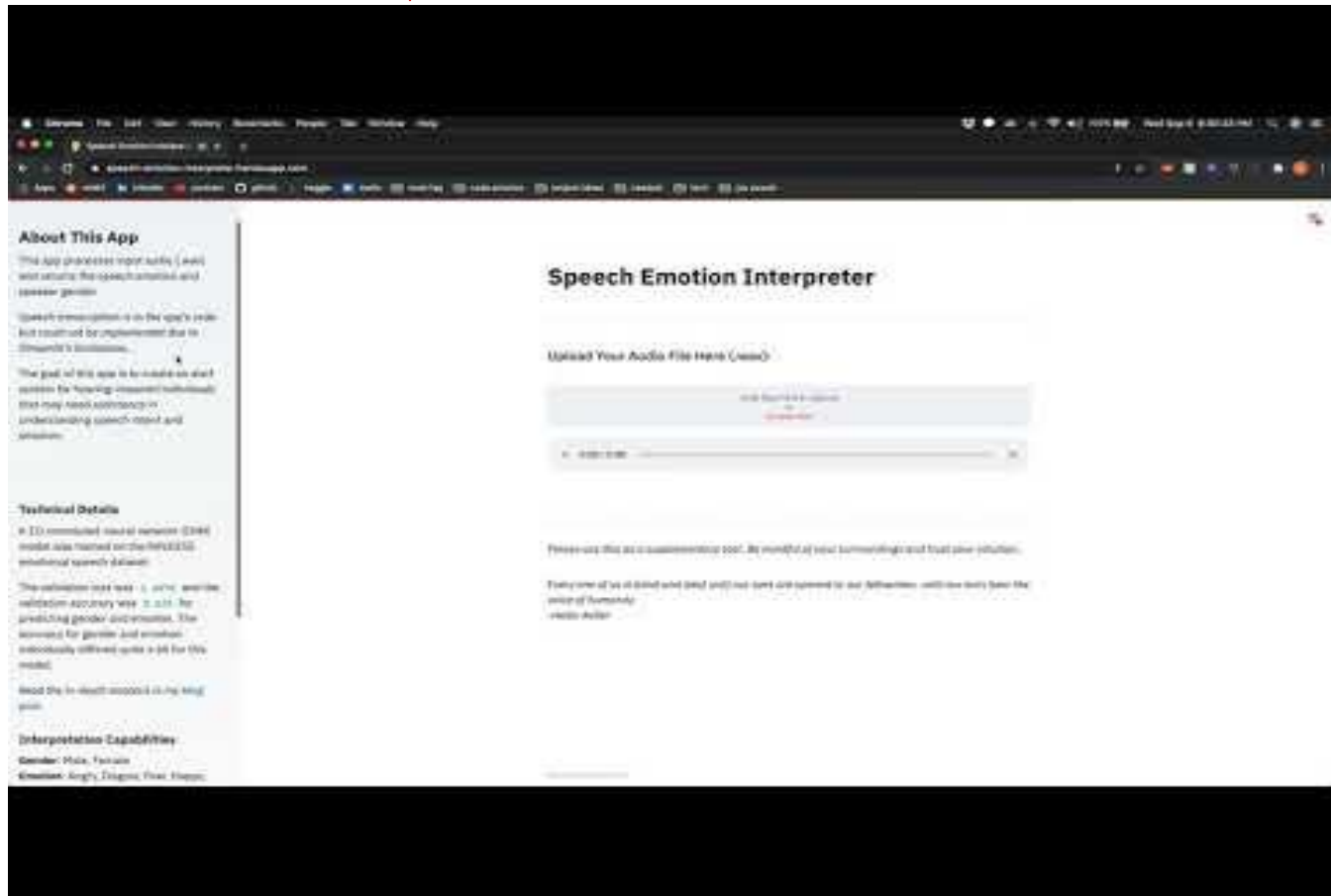
For predicting gender **and** emotion

7.1% chance

At guessing the correct gender and emotion

Speech Emotion Interpreter Demo

<https://speech-emotion-interpreter.herokuapp.com>





Future Considerations and Applications

5.4 Speech to Text

```
import speech_recognition as sr
```

```
r = sr.Recognizer()
```

```
executed in 5ms, finished 17:59:24 2020-09-03
```

```
#male_audio_test speech to text  
david = sr.AudioFile('test_audio/david_audio.wav')  
with david as source:  
    audio = r.record(source)
```

```
type(audio)
```

```
executed in 9ms, finished 17:59:25 2020-09-03
```

```
speech_recognition.AudioData
```

```
r.recognize_google(audio)
```

```
executed in 1.13s, finished 17:59:27 2020-09-03
```

```
'David I need to talk to you right now'
```

- ◆ Separate gender and emotion models
- ◆ Additional audio datasets
- ◆ Speech transcription
- ◆ Haptic feedback



Key Takeaways



Extracting human intent



Personalized assistive devices



Reduce financial impact



Thank You!

You can find me at:

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