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

Source: www.healthyhearing.com

RAVDESS Audio Identifiers

Emotion:

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

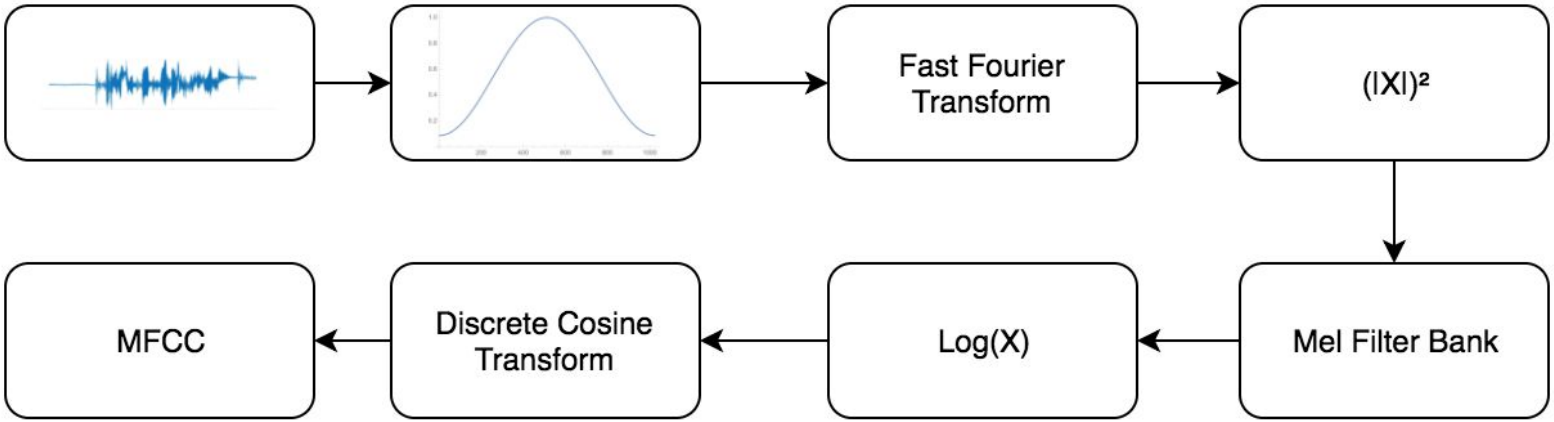
Statement:

“*Kids are talking by the door*”
“*Dogs are sitting by the door*”

Actor:

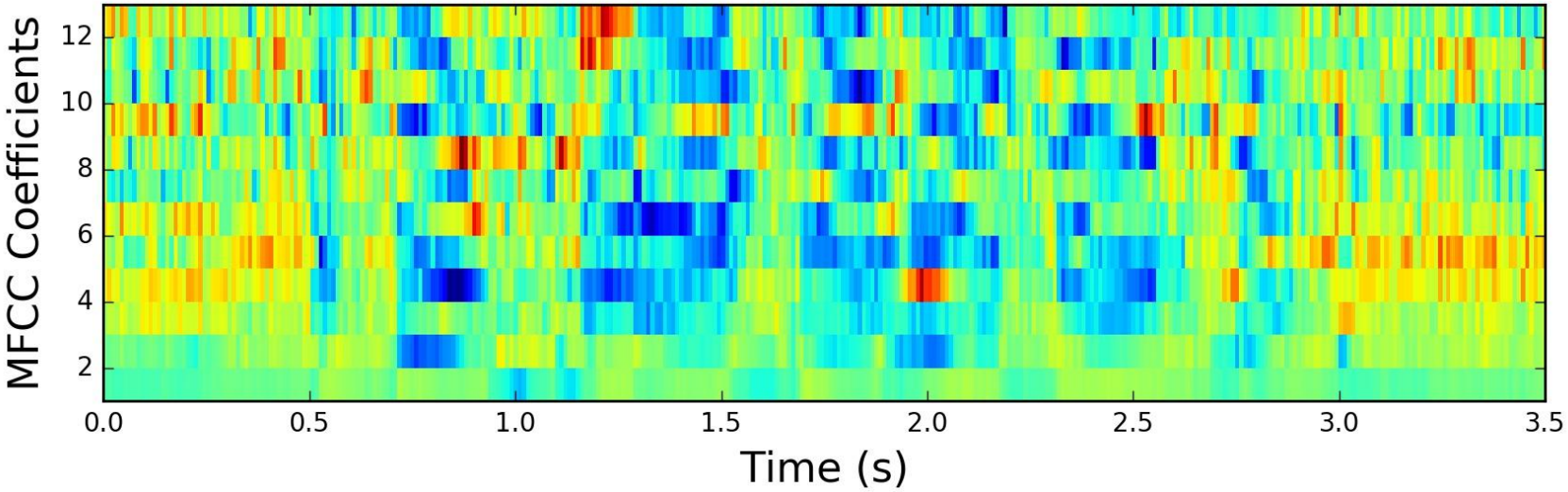
Male
Female

Mel-frequency Cepstral Coefficient (MFCC) Extraction Algorithm



Source: Antoine Chone

Mean-Normalized MFCC for Speech Feature Extraction

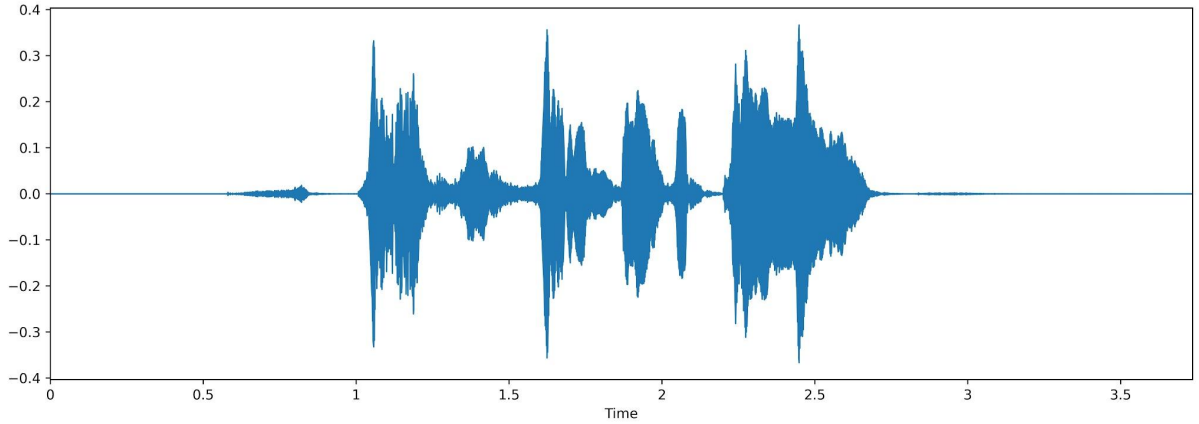


Source: Haytham M. Fayek

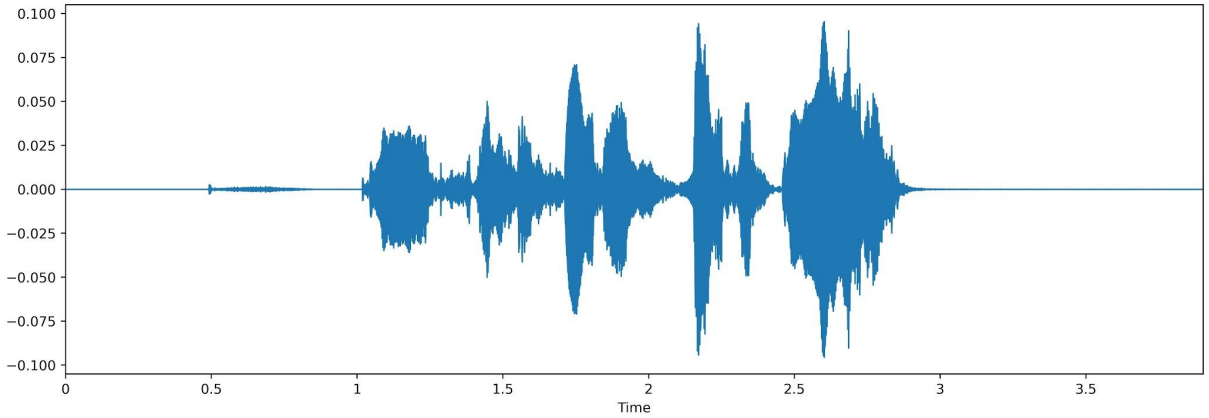
Audio Examples:

“Dogs are sitting by the door”

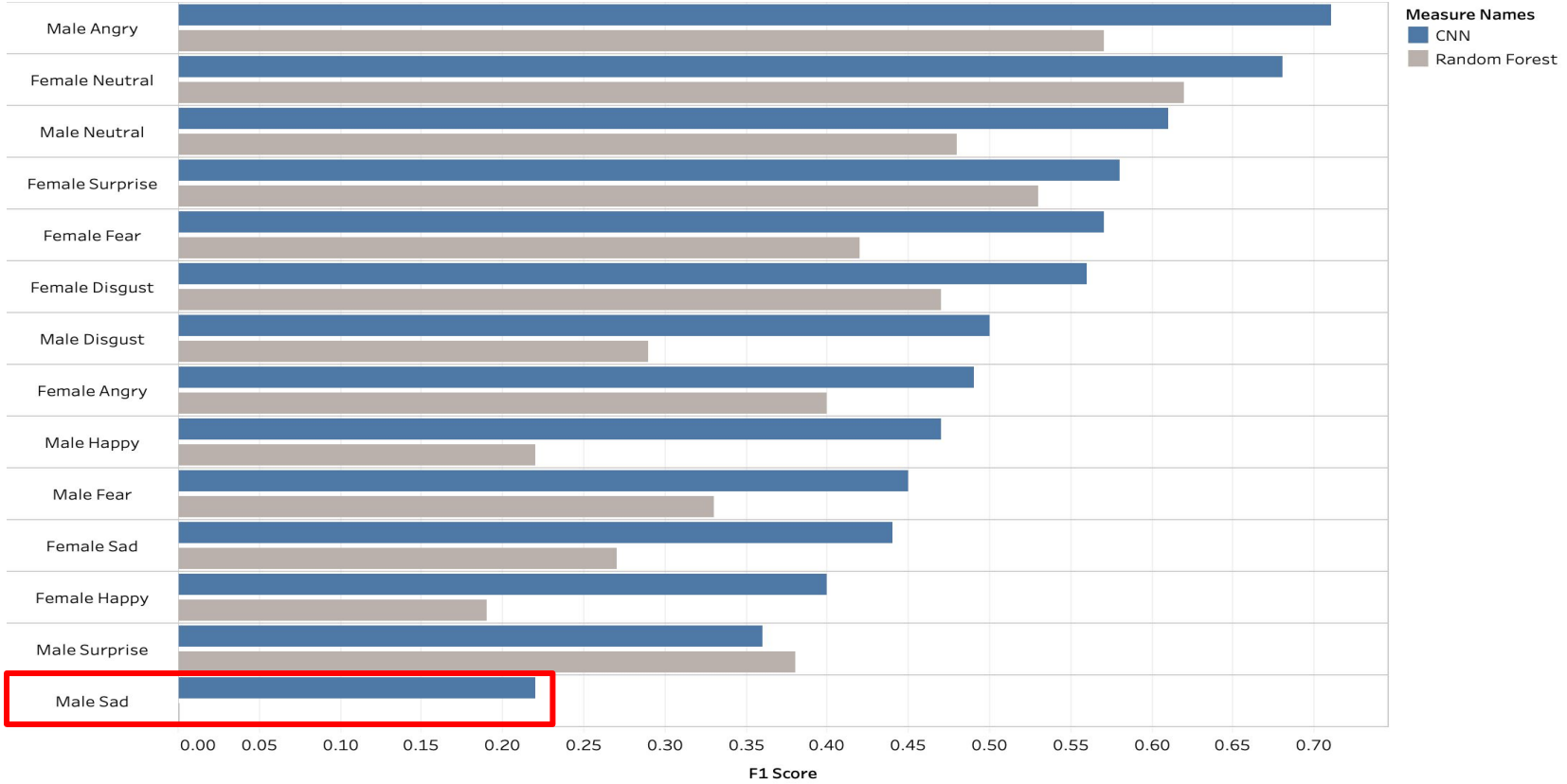
Female Happy



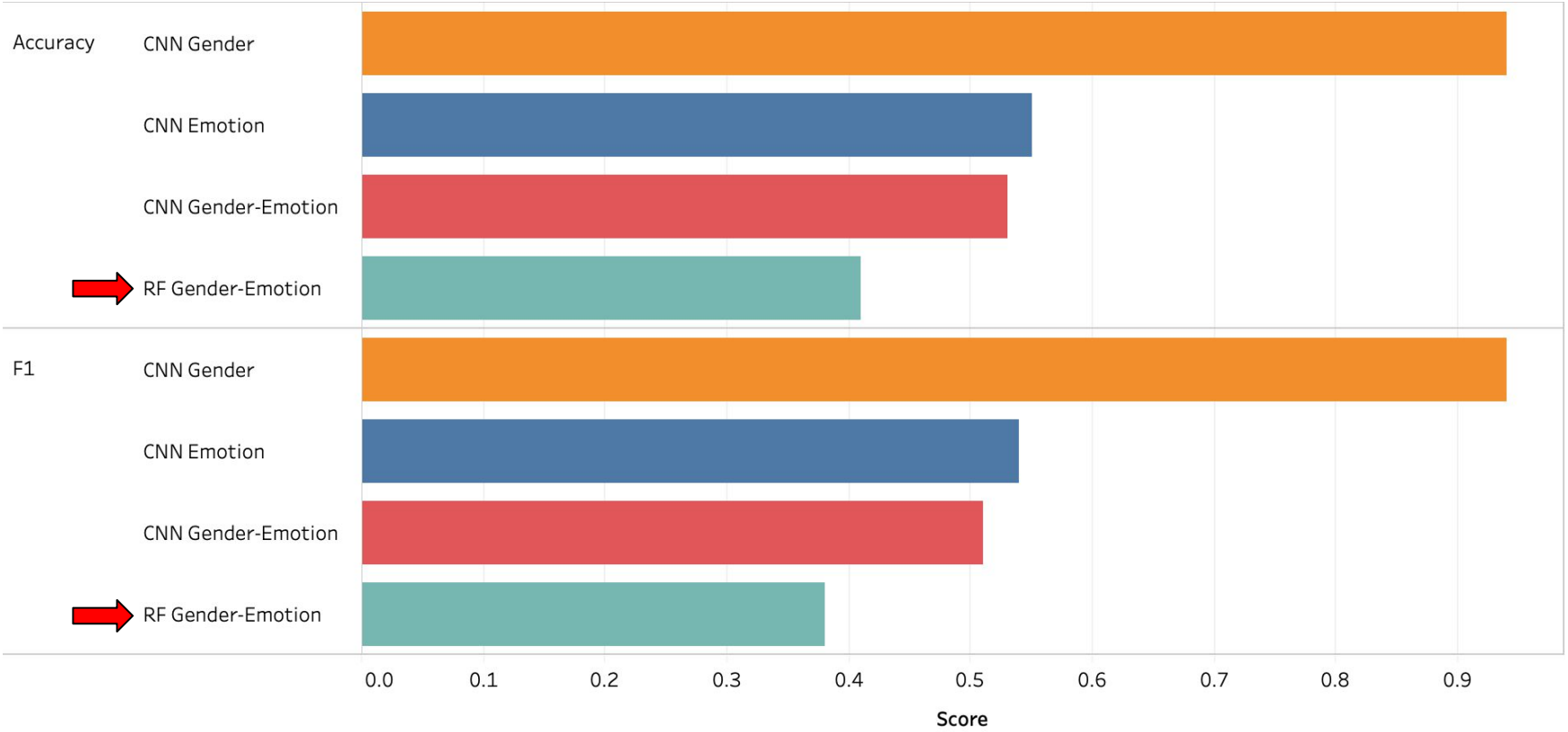
Female Sad



Convoluted 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

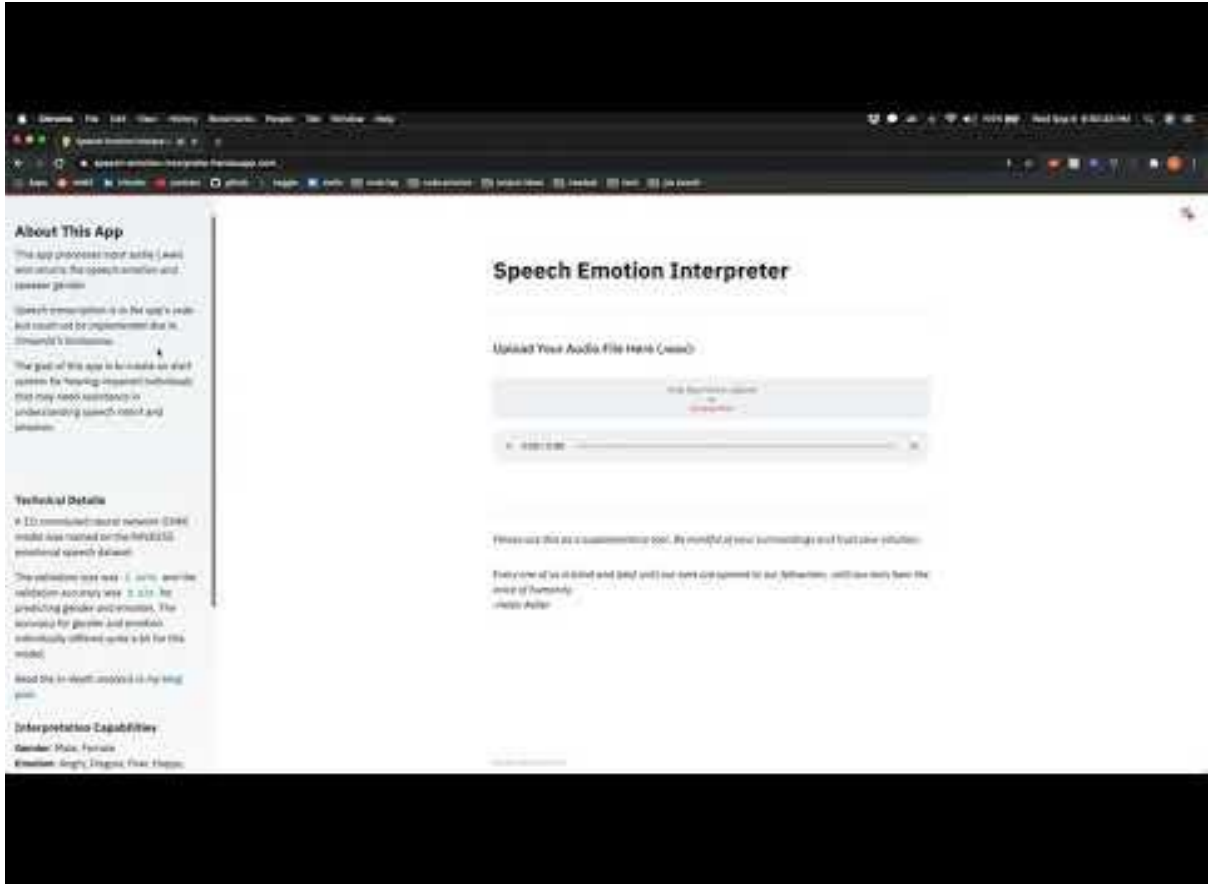
For predicting gender **and** emotion

7.1% chance

At guessing the correct gender and emotion

Speech Emotion Interpreter Demo

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



Key Takeaways

Extracting human intent

Personalized assistive devices

Reduce financial impact

Future Considerations

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'
```

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

Thanks!

Any questions?

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