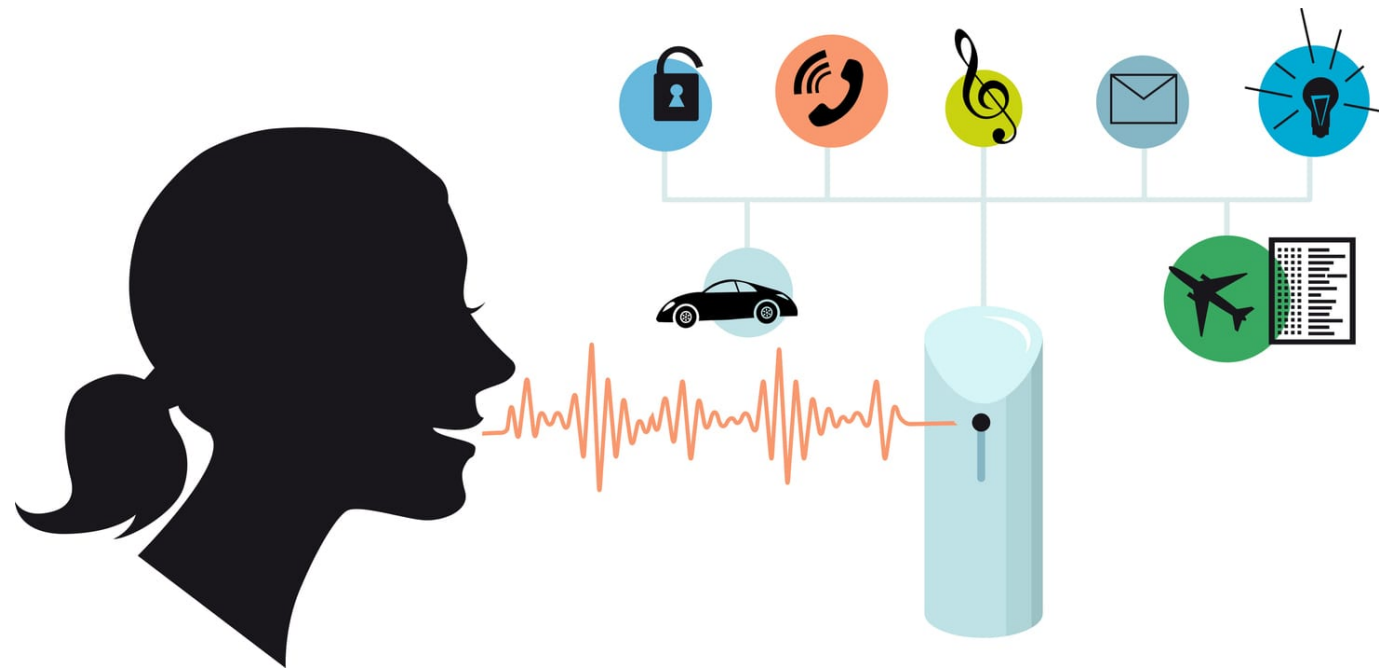


Flex Make it Rain mei 2022

Speech Recognition



Inhoud

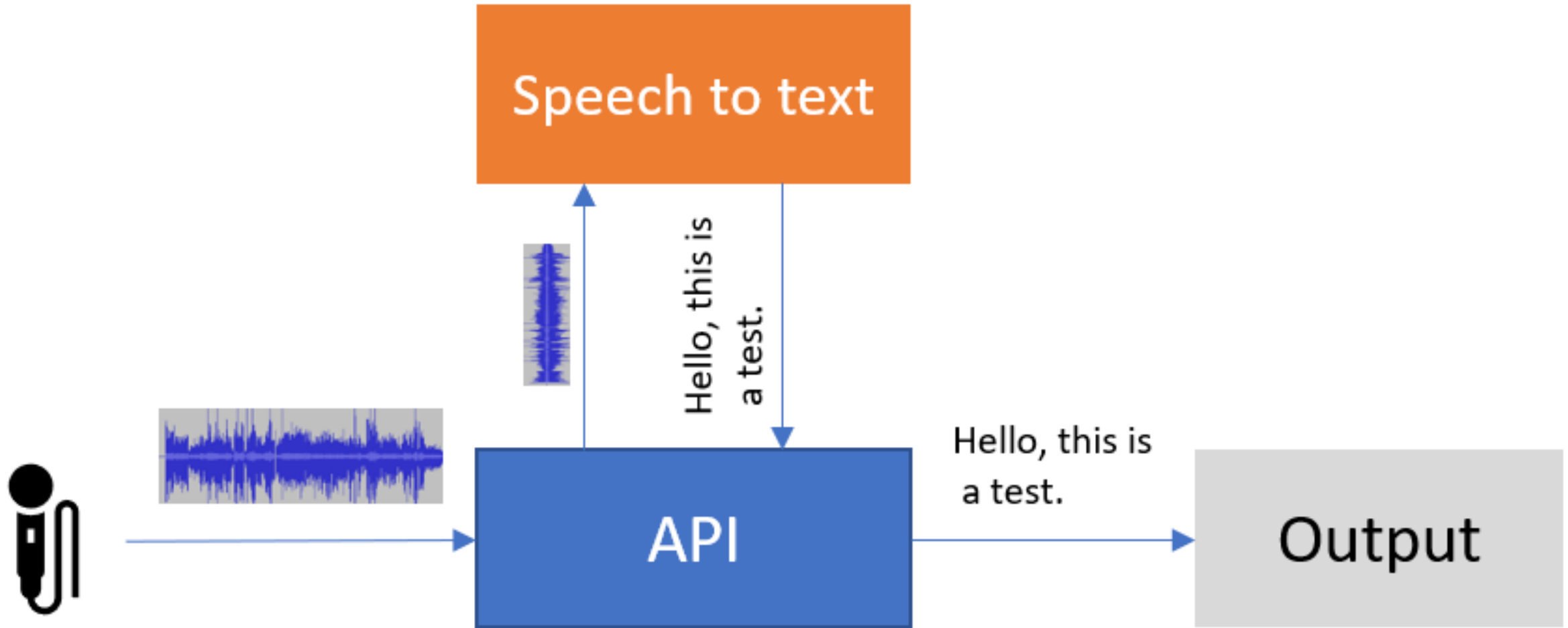
- Speech recognition (spraak herkenning)
 - Overzicht
- Javascript
 - Code voorbeeld
- Opdracht

Speech recognition (spraak herkenning, spraak naar text)

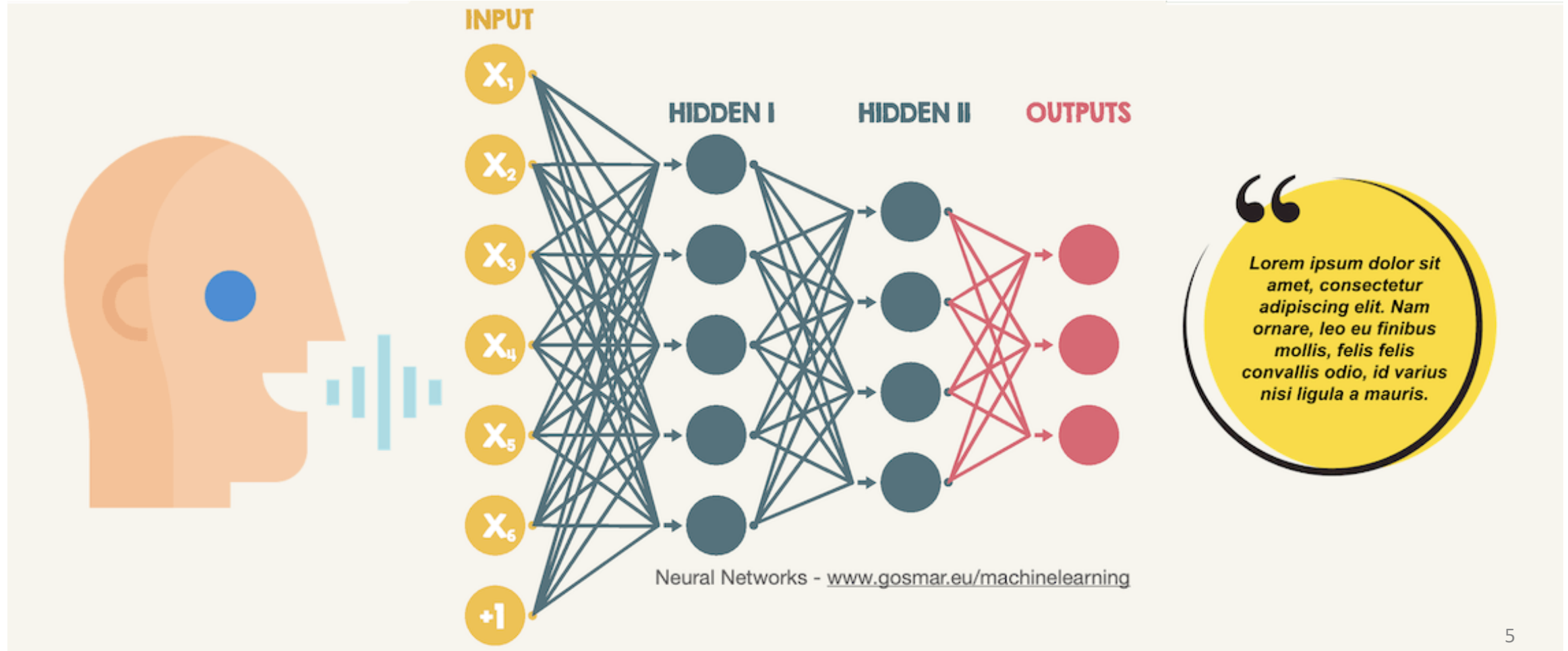
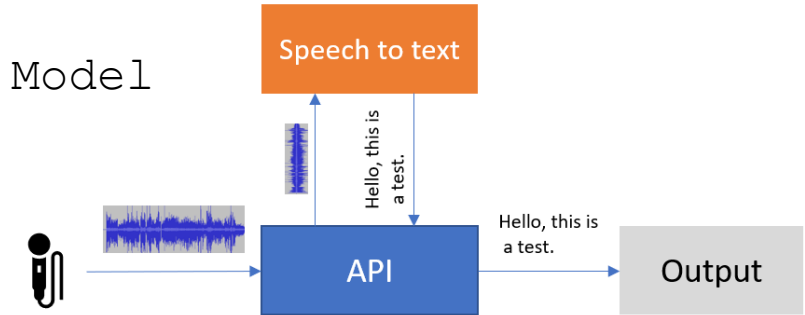
Voorbeelden:

- Tesla Voice Commands
 - Alexa (Amazon)
 - Siri (Apple)
 - Cortana (Microsoft)
 - Google Cloud Speech
 - Chatbots
-
- Medische toepassingen
 - Kun jij voorbeelden bedenken?
-
- Commerciële toepassingen
 - Kun jij voorbeelden bedenken?

Speech recognition software is a computer program that's trained to take the input of human speech, interpret it, and transcribe it into text.



De Speech API is gebaseerd op een Machine Learning Model



Speech recognition (spraak herkenning)

Zelf experimenteren met een [TensorFlow ML model](#)

TensorFlow.js - Audio recognition using transfer learning⌚ 61 mins remaining🌐 Language ▾👤

1 Introduction

2 Requirements

3 Load TensorFlow.js and the Audio model

4 Predict in real-time

5 Test the prediction

6 Collect data

7 Test data collection

8 Train a model

9 Update the slider in real-time

10 Test the final app

TensorFlow.js - Audio recognition using transfer learning

Over dit codelab

⋮ Laatst geüpdatet mei 25, 2021

👤 Geschreven door Daniel Smilkov, Nikhil Thorat, Ann Yuan

1. Introduction

In this codelab, you will build an audio recognition network and use it to control a slider in the browser by making sounds. You will be using TensorFlow.js, a powerful and flexible machine learning library for Javascript.

First, you will load and run a [pre-trained model](#) that can recognize 20 speech commands. Then using your microphone, you will build and train a simple neural network that recognizes your sounds and makes the slider go left or right.

This codelab will **not** go over the theory behind audio recognition models. If you are curious about that, check out [this tutorial](#).

We have also created a [glossary](#) of machine learning terms that you find in this codelab.

What you'll learn

- ✓ How to load a pre-trained speech command recognition model
- ✓ How to make real-time predictions using the microphone
- ✓ How to train and use a custom audio recognition model using the browser microphone

So let's get started.

Javascript

Voor onze toepassing gaan wij de Javascript Speech to Tekst API van Google gebruiken

PRO

- Direct beschikbaar op een aantal [platformen](#)
- Gratis
- Redelijk gedocumenteerd
- Betrouwbaarheid spraakherkenning, aanvaardbaar
- Meerdere talen beschikbaar

CON

- Werkt met een server-based recognition engine
 - Werkt niet offline
 - Privacy not included
- Werkt niet op alle platformen, zoals Firefox (tenzij je de about:config aanpast)

Browser compatibility												
Report problems with this compatibility data on GitHub												
	Desktop						Mobile					
	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Chrome Android	Firefox for Android	Opera Android	Safari on iOS	Samsung Internet	WebView Android
SpeechRecognition	✓ 33	✓ 79	✗ No	✗ No	✗ No	✓ 14.1	✓ 33	✗ No	✗ No	✓ 14.5	✓ 2.0	✓ 4.4.3
	✗	✗				✗	✗			✗	✗	✗
	*	*					*				*	

Javascript Speech to Tekst API van Google

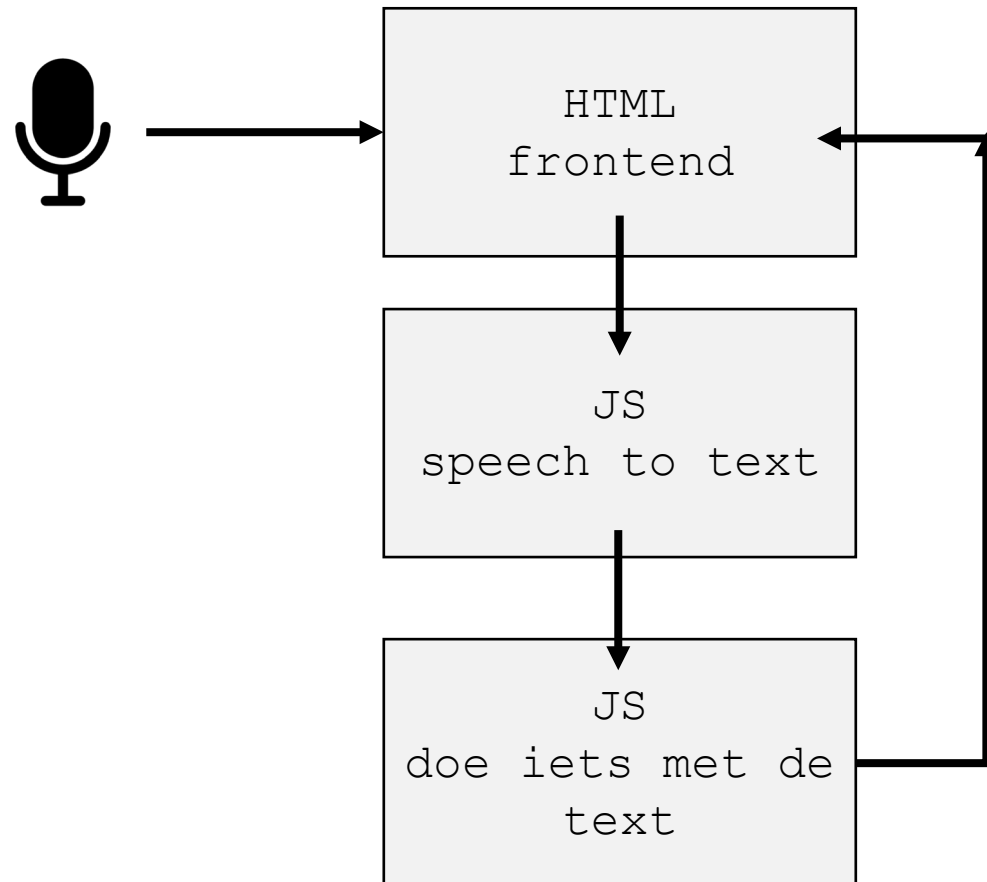
- Documentatie:

<https://developer.mozilla.org/en-US/docs/Web/API/SpeechRecognition>

- Demo:

<https://mediacollegeamsterdam.github.io/Speech-to-text-2022/>

Javascript overzicht



```
//speech to text  
> startRecognition = () => { ...  
};
```

```
// process speech results  
> actionSpeech = (speechText) => { ...  
}
```

speech to text



JS
doe iets met de
text

```
//speech to text
startRecognition = () => {
  if (SpeechRecognition !== undefined) { // test if speechrecognitio is supported
    let recognition = new SpeechRecognition();
    recognition.lang = 'en-US'; // which language is used?
    recognition.interimResults = false; // https://developer.mozilla.org/en-US/docs/Web/API/SpeechRecognition
    recognition.continuous = false; // https://developer.mozilla.org/en-US/docs/Web/API/SpeechRecognition

    recognition.onstart = () => {
      message.innerHTML = `Starting listening, speak in the microphone please<br>Say "help me" for help`;
      output.classList.add("hide"); // hide the output
    };

    recognition.onspeechend = () => {
      message.innerHTML = `I stopped listening `;
      recognition.stop();
    };

    recognition.onresult = (result) => {
      let transcript = result.results[0][0].transcript;
      let confidenceTranscript= Math.floor(result.results[0][0].confidence * 100); // calc. 'confidence'
      output.classList.remove("hide"); // show the output
      output.innerHTML = `I'm ${confidenceTranscript}% certain you just said: <b>${transcript}</b>`;
      actionSpeech(transcript);
    };

    recognition.start();
  }
  else { // speechrecognition is not supported
    message.innerHTML = "sorry speech to text is not supported in this browser";
  }
};
```

doe iets met text

JS

speech to text

HTML

frontend

```
// process speech results
actionSpeech = (speechText) => {
  speechText = speechText.toLowerCase().trim(); // trim spaces + to lower case
  console.log(speechText); // debug
  switch(speechText){
    // switch evaluates using strict comparison, ===
    case "black":
      document.body.style.background = "#000000";
      document.body.style.color="#FFFFFF";
      break;
    case "reset":
      document.body.style.background = "#ffe6ab";
      document.body.style.color="#000000";
      image1.classList.add("hide"); // hide image (if any)
      break;
    case "image": // let op, "fall-through"
    case "caroline": // let op, "fall-through"
      image1.src = "../img/caroline.jpg";
      image1.style.width = "400px";
      image1.classList.remove("hide") // show image
      break;
    case "next page":
      window.open("https://www.ma-web.nl/", "_self");
      break;
    case "help me":
      alert("Valid speech commands: black, reset, next page");
      break;
    default:
      // do nothing yet
  }
}
```

Mogelijke uitbreiding, google search

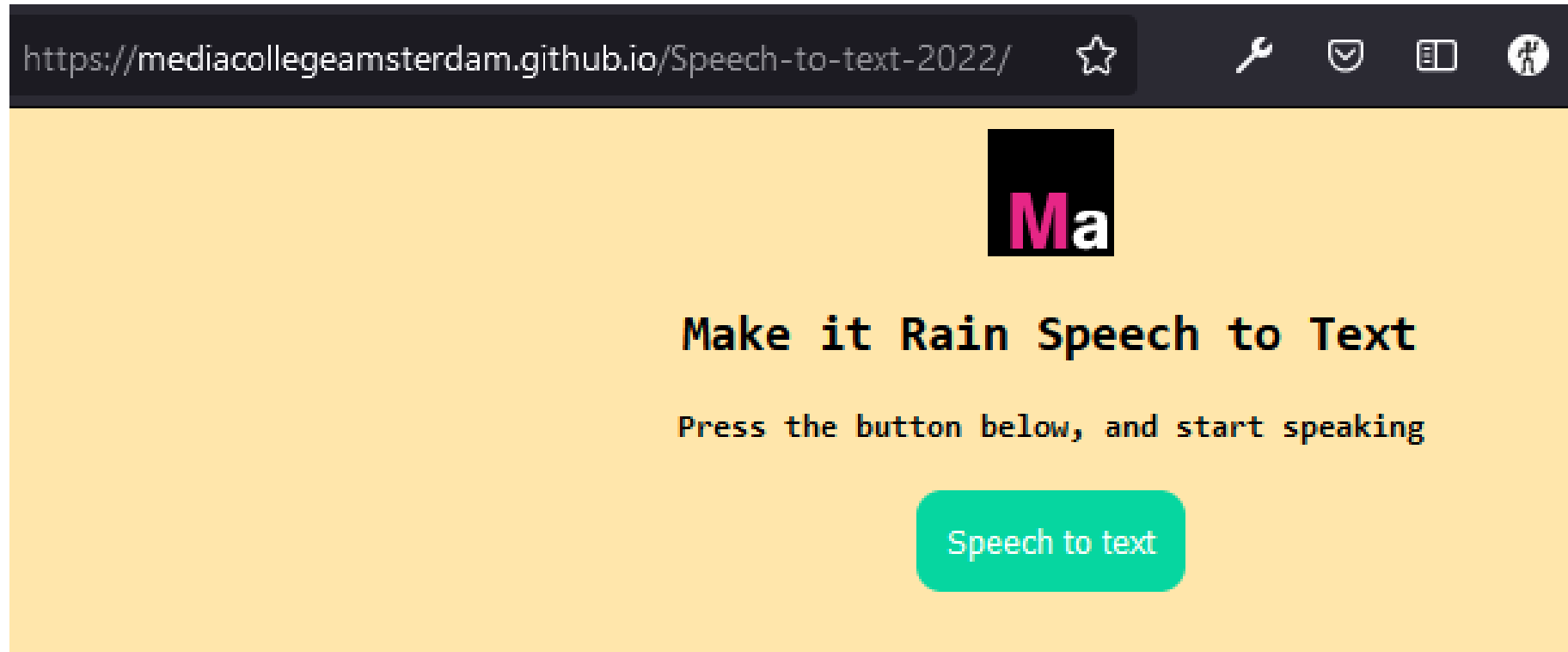
```
default:
```

```
    window.open("https://www.google.com/search?q=" + speechText);
```

```
    }, {  
    speechText = speechText.toLowerCase().trim(); // trim spaces + to lower case  
    console.log(speechText); // debug  
    switch(speechText){  
        // switch evaluates using strict comparison, ===  
        case "black":  
            document.body.style.background = "#000000";  
            document.body.style.color="#FFFFFF";  
            break;  
        case "reset":  
            document.body.style.background = "#ffe6ab";  
            document.body.style.color="#000000";  
            image1.classList.add("hide"); // hide image (if any)  
            break;  
        case "image": // let op, "fall-through"  
        case "caroline": // let op, "fall-through"  
            image1.src = "./img/caroline.jpg";  
            image1.style.width = "400px";  
            image1.classList.remove("hide") // show image  
            break;  
        case "next page":  
            window.open("https://www.ma-web.nl/", "_self");  
            break;  
        case "help me":  
            alert("Valid speech commands: black, reset, next page");  
            break;  
        default:  
            // do nothing yet  
    }  
}
```

Startcode <https://github.com/MediacollegeAmsterdam/Speech-to-text-2022>

Demo <https://mediacollegeamsterdam.github.io/Speech-to-text-2022/>



Github Maak een site van jouw repository

- Documentatie: <https://docs.github.com/en/pages/getting-started-with-github-pages/creating-a-github-pages-site#creating-your-site>

Opdracht

- Clone de repository met de start code
- Verander de taal van Speech API, nu **en-US** naar een andere taal, nederlands of een taal naar keuze (je moet dit wel kunnen demonstrenen).
- Maak code waarmee jouw naam herkend wordt
 - Open met jouw naam in een nieuwe tab jouw Linked-In page.
- Maak code waarmee jij een product pagina opent
- Maak code waarmee jij een product image laat zien
- Zet jouw code in jouw git repo
- Maak van jouw git repo een site ([voorbeeld](#))
- Lever 2 links in
 - Git repo url
 - Git site url
- Inleveren: aftekenen in de les

Challenge

- Koppel de speech to text software aan een image slider
- Maak de google search met speech input werkend
- Kom met een voorstel

Volgende lessen

- Introductie Machine Learning
- Speech recognition, zoeken in database met Ajax