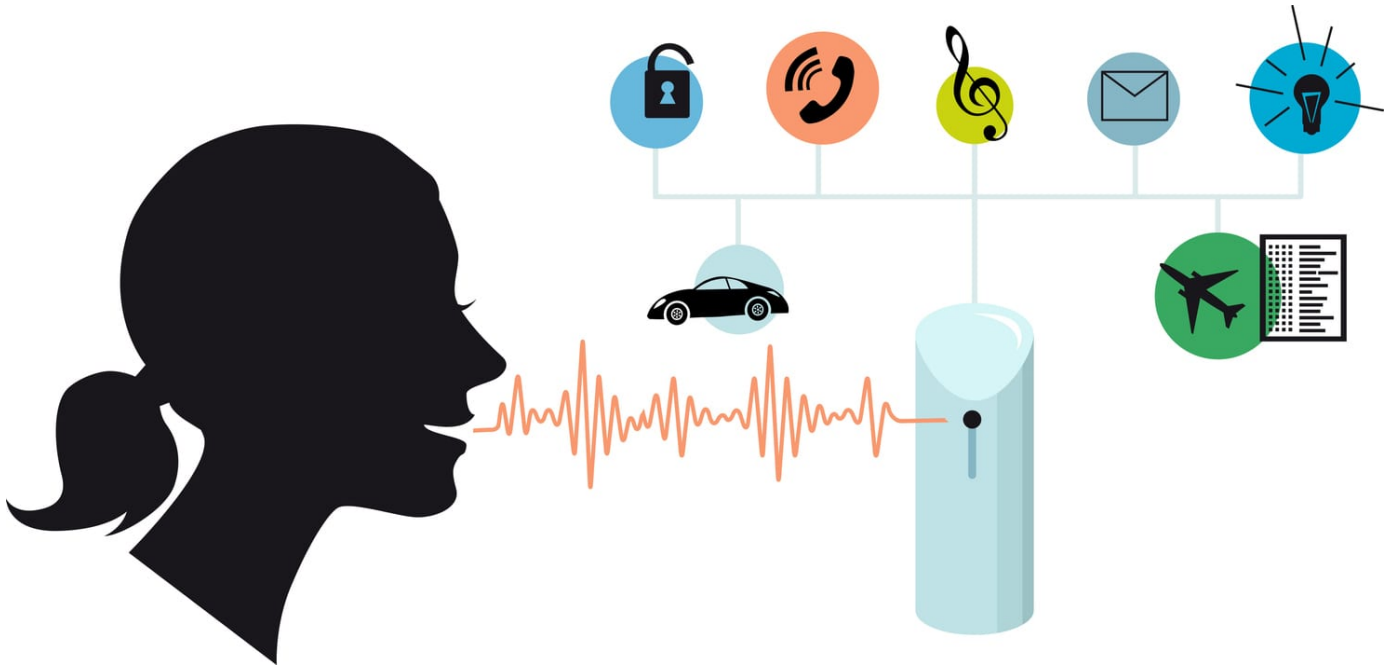
Flex Make it Rain mei 2022

Speech Recognition



Inhoud

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

Speech recognition (spraak herkenning, spraak naar text)

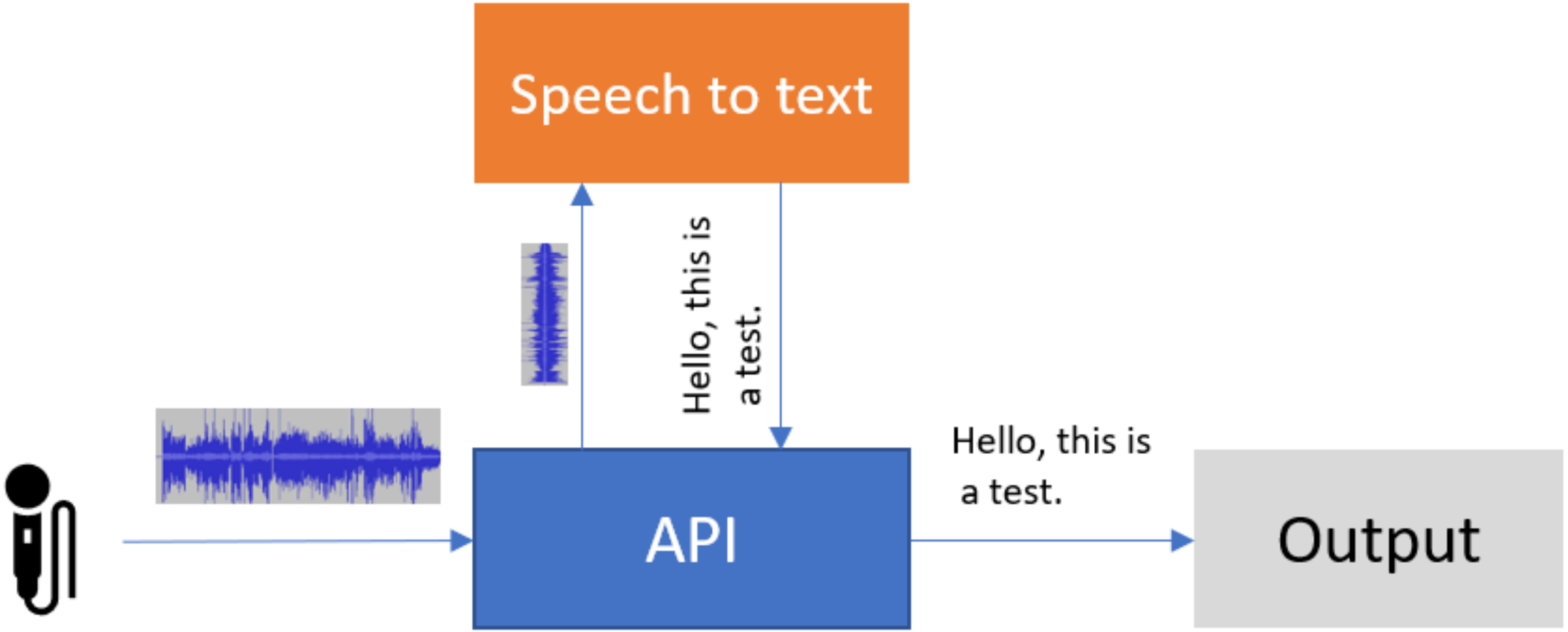
Voorbeelden:

- Tesla Voice Commands
- Alexa (Amazon)
- Siri (Apple)
- Cortana (Microsoft)
- Google Cloud Speech
- Chatbots

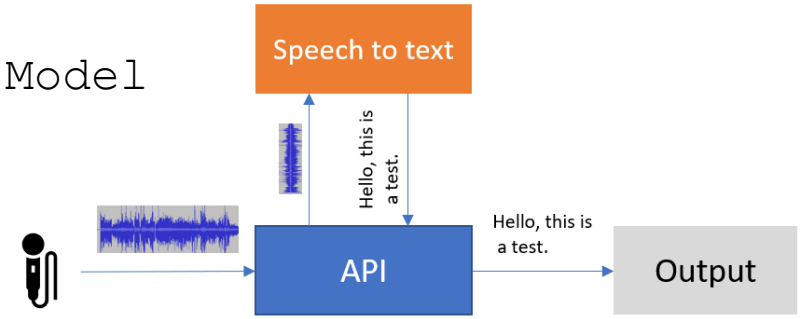
- Medische toepassingen
  - Kun jij voorbeelden bedenken?

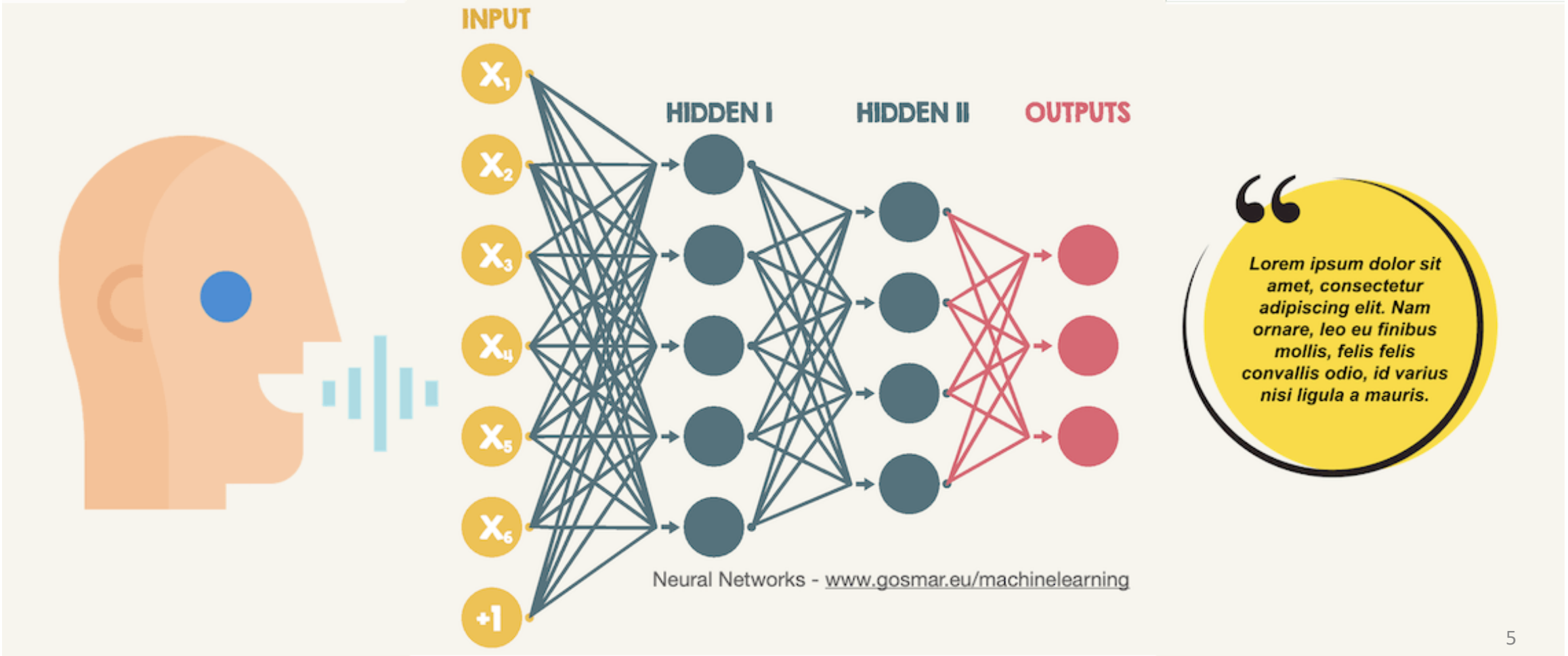
- Commerciële toepassingen
  - Kun jij voorbeelden bedenken?

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



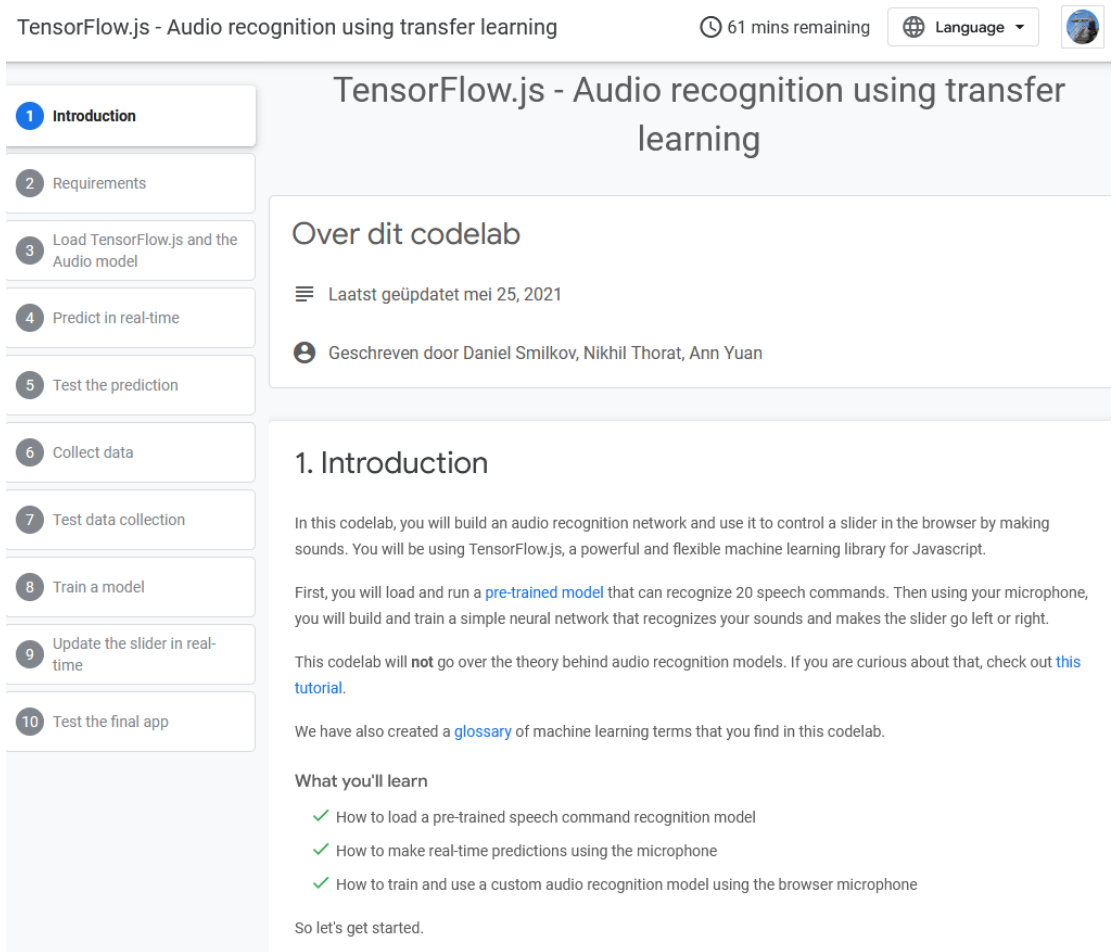
De Speech API is gebaseerd op een Machine Learning Model





Speech recognition (spraak herkenning)

Zelf experimenteren met een TensorFlow ML model

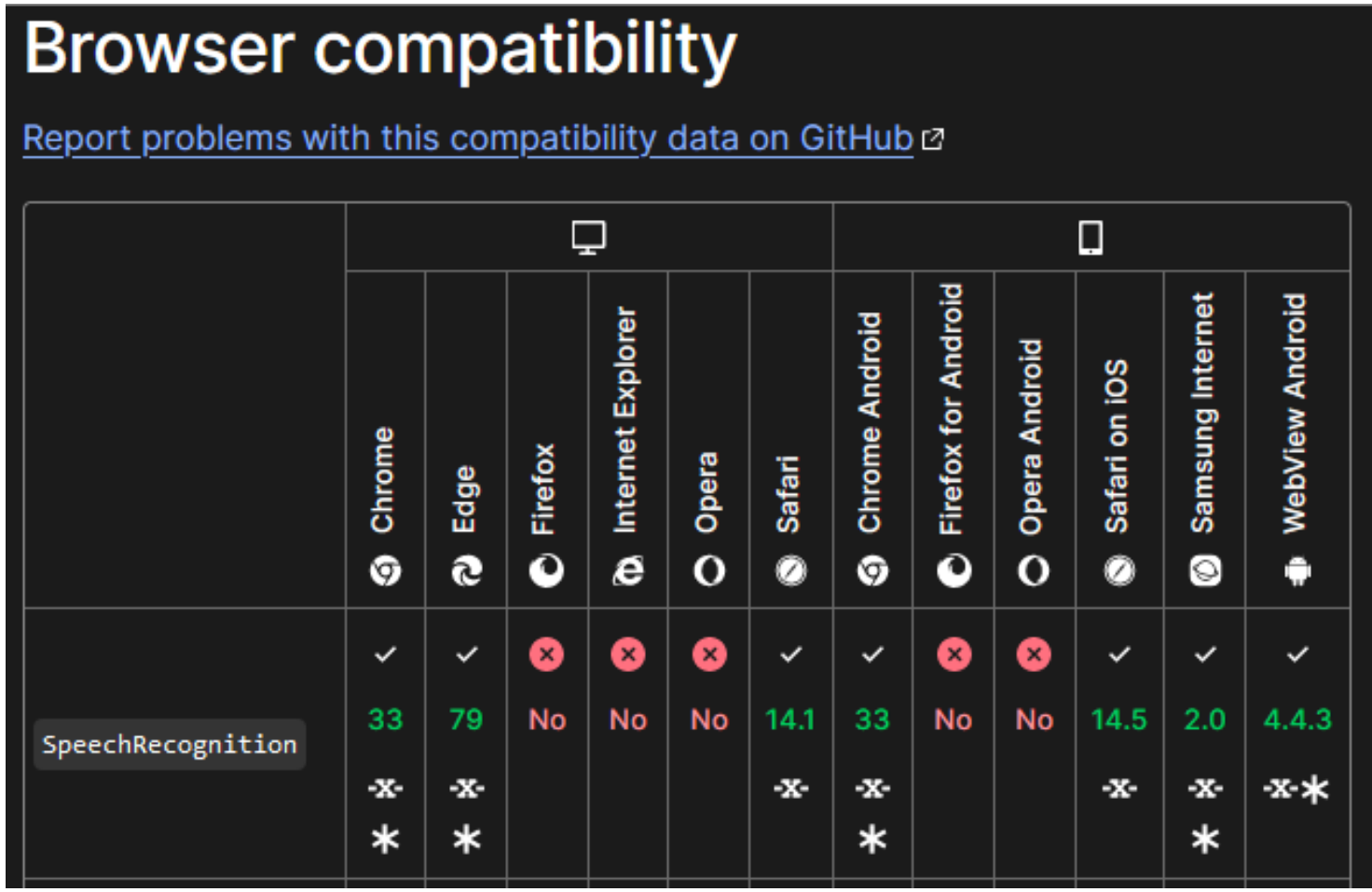


Javascript

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)

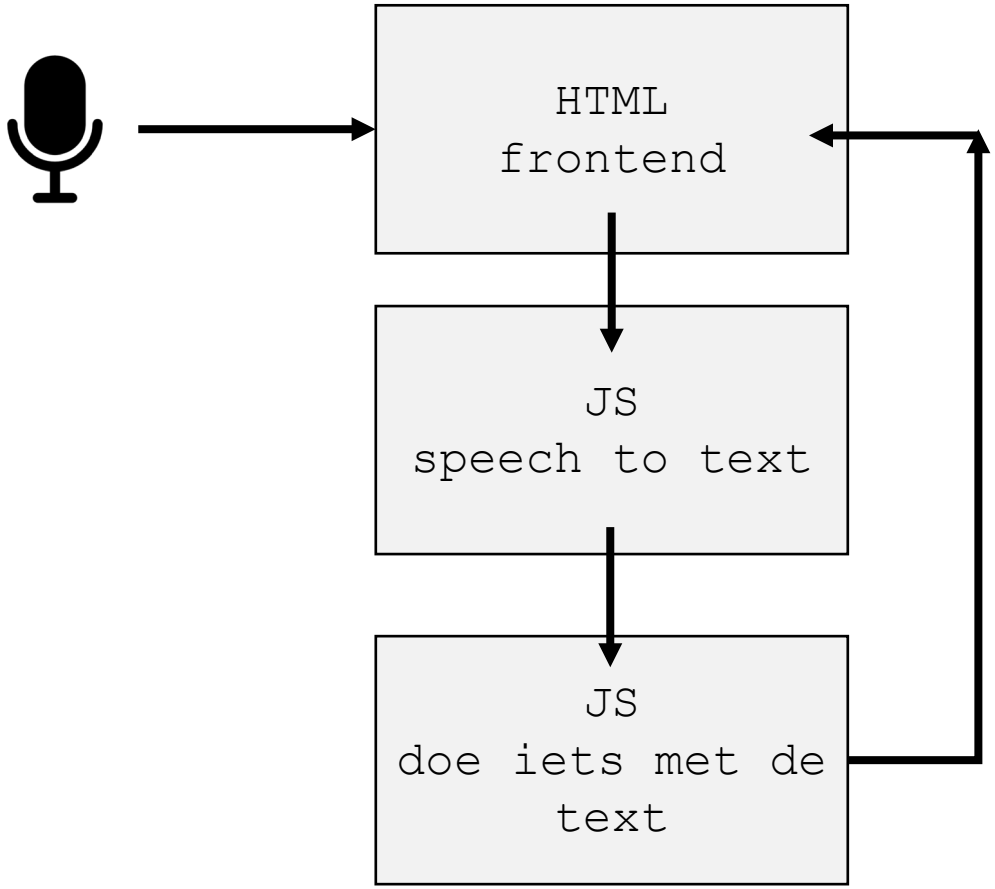


Javascript Speech to Tekst API van Google

- 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/SpeechRecognit
    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
  }
}
```

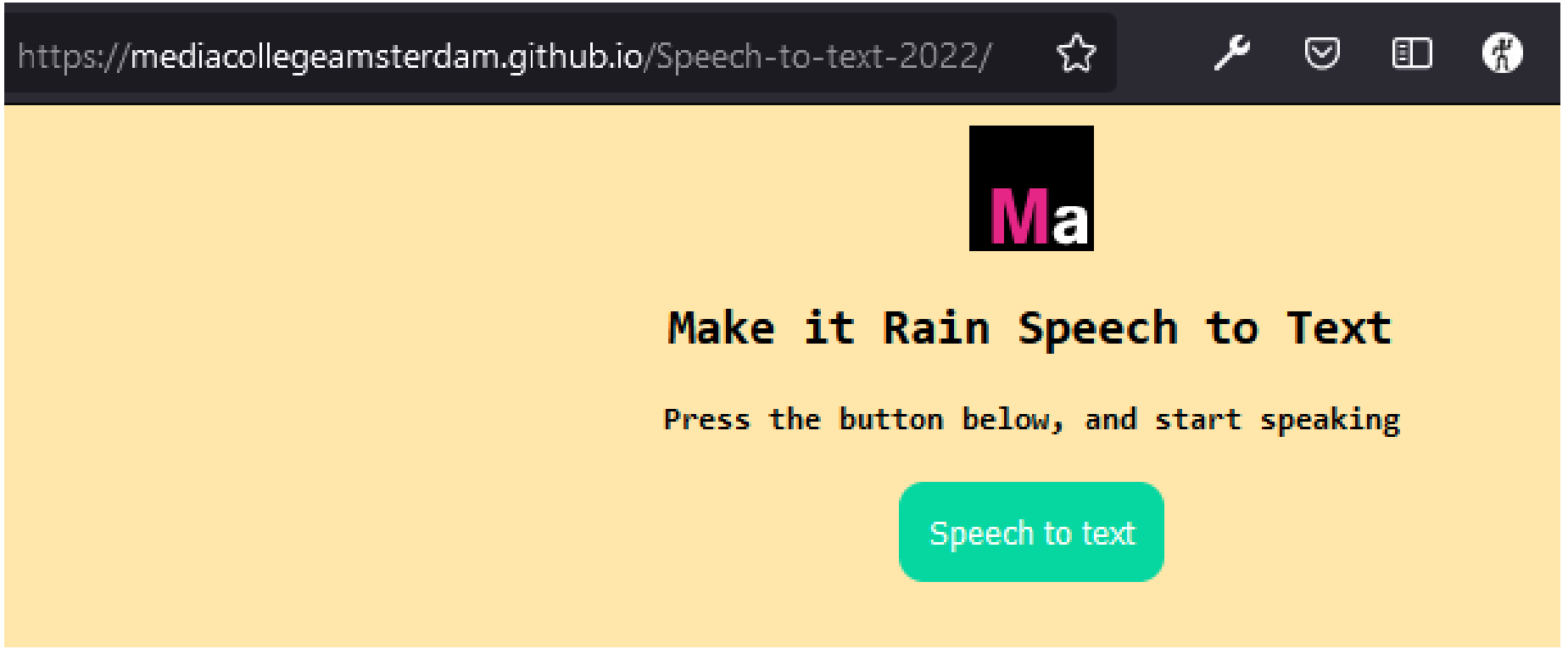
Mogelijke uitbreiding, google search

```
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 demonstreren).
- 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