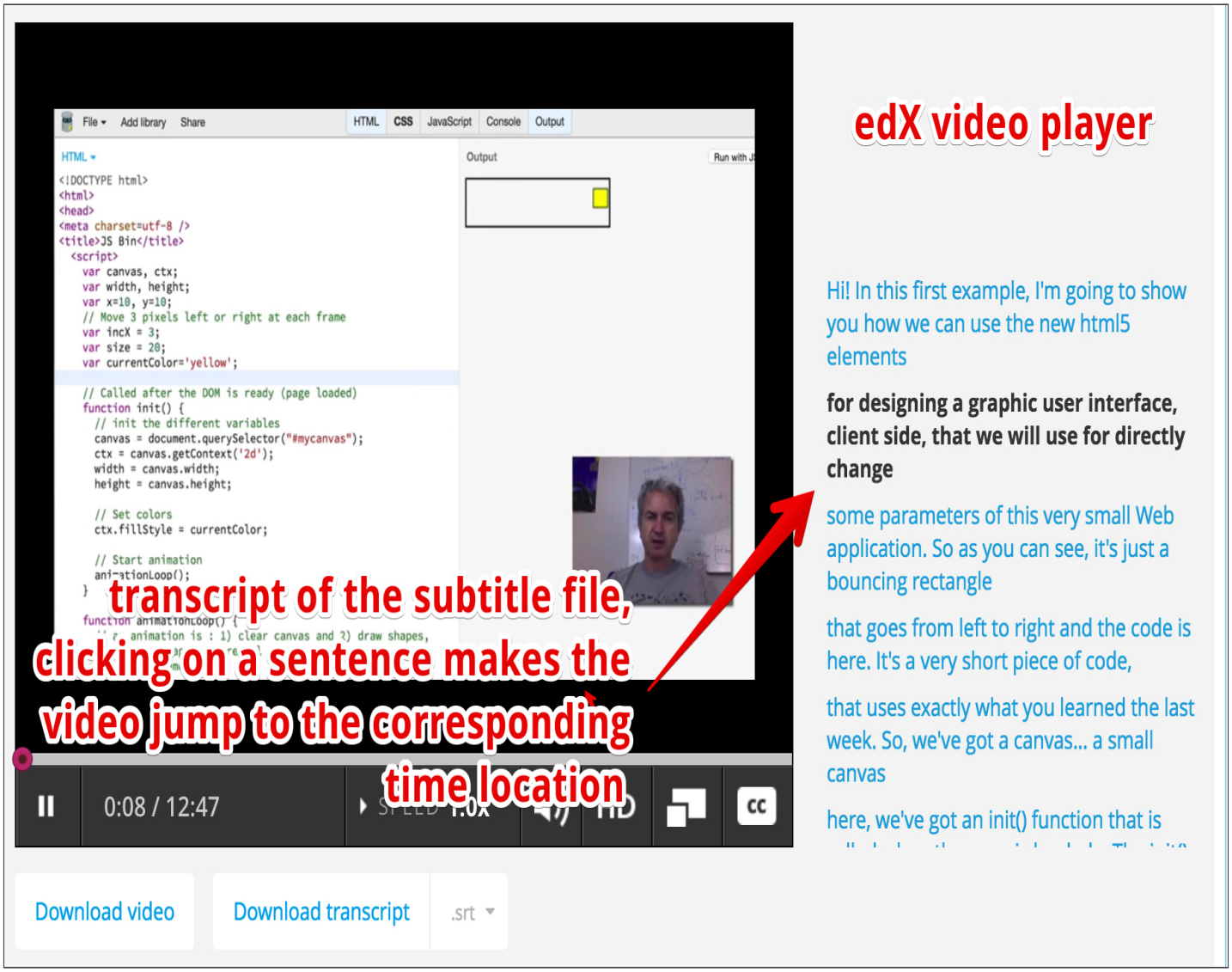
Example 1: a video player with clickable transcript - reading WebVTT file content at once

A few words about the set of five examples presented in this chapter: the code of the examples is larger than usual, but each example integrates blocks of code already presented and detailed in the previous lessons.

CREATING AN ACCESSIBLE PLAYER WITH A CLICKABLE TRANSCRIPT OF THE VIDEO PRESENTATION

It might be interesting to read the content of a track before playing the video. This is what the edX video player does: it reads a single subtitle file and displays it as a transcript on the right. In the transcript you can click on a sentence to make the video jump to the corresponding location. We will see how we can do this using the track API.



EXAMPLE 1: READ THE WEBVTT FILE AT ONCE USING THE TRACK API AND MAKE A CLICKABLE TRANSCRIPT

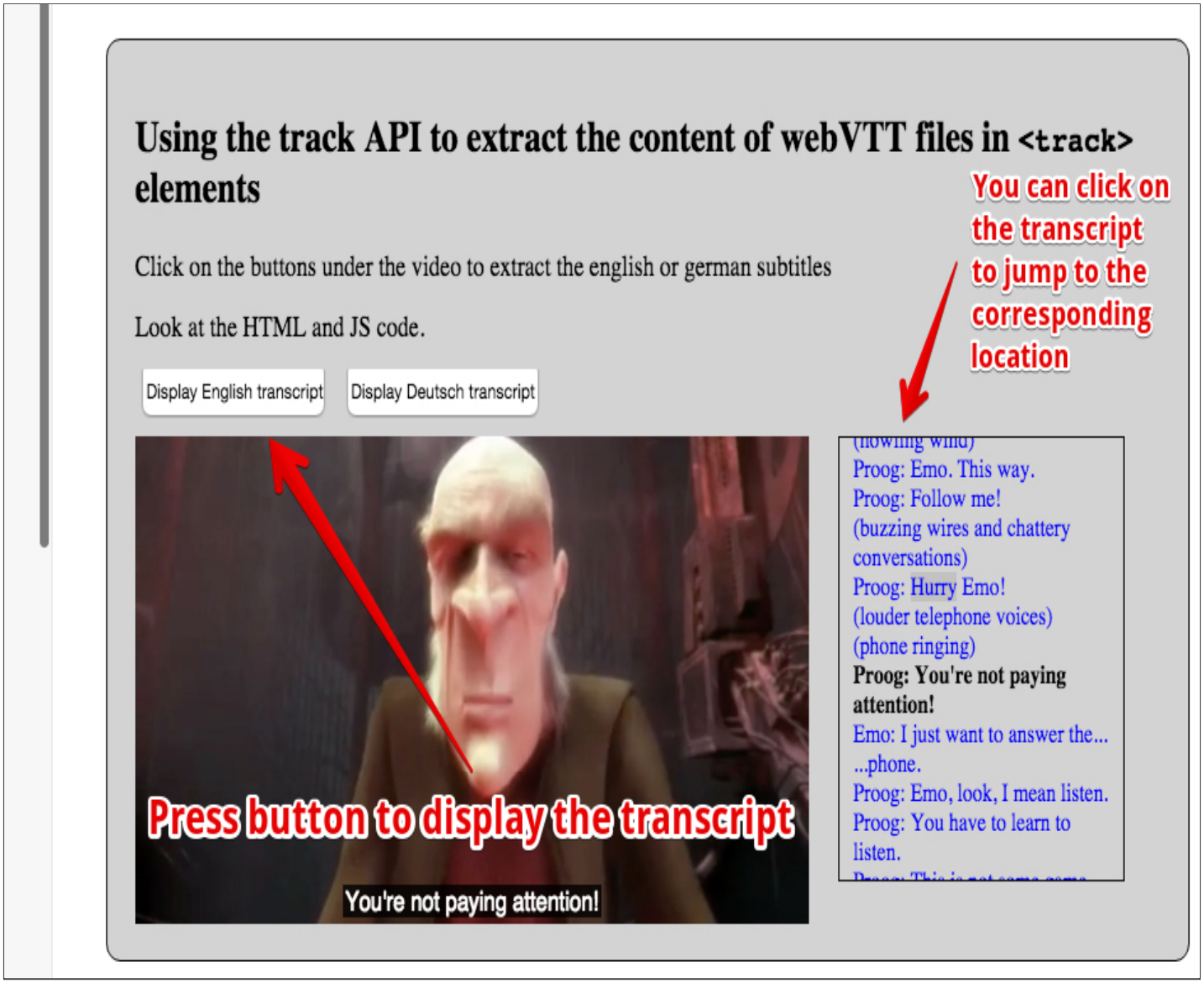
Here we decided to code something similar, except that this time we can choose the track. In the example we have English and German subtitles, and also another track that contains the chapter descriptions (more on that later). By clicking on a button we display the transcript on the right. Like the edX player, we can click on any sentence in order to force the video to jump to the corresponding location. While the video is playing, the current text is highlighted.

Some important things here:

1. Browsers do not load all the tracks at the same time, and the way they decide when and which track to load differs from one browser to another. So, when we click on a button to choose the track to display, we need t*o enforce the loading of the track if it has not been loaded yet*.

2. When a track file is loaded, then we iterate on the different cues and generate the transcript as a set of `<li>...</li>`elements. One `<li>` per cue/sentence.
3. We set the `id` attribute of the `<li>` with the `cue.id` value. In this way, when we click on a `<li>` we can get its `id` and find the corresponding cue start time, and make the video jump to this time location.
4. We add to each cue an `enter` and an `exit` listener. These will be useful for highlighting the current cue. Note that these listeners are not yet supported by FireFox (you can use a `cuechange` event listener on a `TextTrack` instead - the source code for FireFox is commented in the example).

Try this example at JSBin:



HTML code:

```
<section id="all">
 <button disabled id="buttonEnglish"
         onclick="loadTranscript('en');">
    Display English transcript
 </button>
 <button disabled id="buttonDeutsch"
         onclick="loadTranscript('de');">
    Display Deutsch transcript
</button>
 </p>
 <video id="myVideo" preload="metadata"controls crossOrigin="anonymous">
     <source src="http://...../elephants-dream-medium.mp4"
             type="video/mp4">
     <source src="http://...../elephants-dream-medium.webm"
             type="video/webm">
     <track label="English subtitles"
            kind="subtitles"
            srclang="en"
            src="http://...../elephants-dream-subtitles-en.vtt" >
     <track label="Deutsch subtitles"
            kind="subtitles"
            srclang="de"
            src="http://...../elephants-dream-subtitles-de.vtt"
            default>
     <track label="English chapters"
            kind="chapters"
            srclang="en"
            src="http://...../elephants-dream-chapters-en.vtt">
</video>
<div id="transcript"></div>
</section>
```

CSS code:

```
#all {
   background-color: lightgrey;
   border-radius:10px;
   padding: 20px;
   border:1px solid;
   display:inline-block;
   margin:30px;
```

```
    width:90%;
}

.cues {
    color:blue;
}

.cues:hover {
    text-decoration: underline;
}

.cues.current {
    color:black;
    font-weight: bold;
}

#myVideo {
    display: block;
    float : left;
    margin-right: 3%;
    width: 66%;
    background-color: black;
    position: relative;
}

#transcript {
    padding: 10px;
    border:1px solid;
    float: left;
    max-height: 225px;
    overflow: auto;
    width: 25%;
    margin: 0;
    font-size: 14px;
    list-style: none;
}
```

JavaScript code:

```
var video, transcriptDiv;
// TextTracks, html tracks, urls of tracks
var tracks, trackElems, tracksURLs = [];
```

```
var buttonEnglish, buttonDeutsch;

window.onload = function() {
   console.log("init");
   // when the page is loaded, get the different DOM nodes
   // we're going to work with
   video =document.querySelector("#myVideo");
   transcriptDiv =document.querySelector("#transcript");

   // The tracks as HTML elements
   trackElems =document.querySelectorAll("track");
   // Get the URLs of the vtt files
   for(var i = 0; i < trackElems.length;i++) {
      var currentTrackElem =trackElems[i];
      tracksURLs[i] =currentTrackElem.src;
   }
   buttonEnglish =document.querySelector("#buttonEnglish");
   buttonDeutsch =document.querySelector("#buttonDeutsch");

   // we enable the buttons only in this load callback,
   // we cannot click before the video is in the DOM
   buttonEnglish.disabled = false;
   buttonDeutsch.disabled = false;
   // The tracks as TextTrack JS objects
   tracks = video.textTracks;
};

function loadTranscript(lang) {
  // Called when a button is clicked
  // clear current transcript
  clearTranscriptDiv();
  // set all track modes to disabled. We will only activate the
  // one whose content will be displayed as transcript
  disableAllTracks();
  // Locate the track with language = lang
  for(var i = 0; i < tracks.length; i++){
    // current track
    var track = tracks[i];
    var trackAsHtmlElem = trackElems[i];
    // Only subtitles/captions are ok for this example...
    if((track.language === lang) &&(track.kind !== "chapters")) {
       track.mode="showing";

       if(trackAsHtmlElem.readyState ===2) {
```

```
            // the track has already been loaded
            displayCues(track);
        } else {
58.         displayCuesAfterTrackLoaded(trackAsHtmlElem, track);
        }
        /* Fallback for FireFox that still does not implement cue
enter and exit events
          track.addEventListener("cuechange", function(e) {
              var cue = this.activeCues[0];
              console.log("cue change");
              var transcriptText = document.getElementById(cue.id);
              transcriptText.classList.add("current");
          });
      */
69.     }
  }
}
functiondisplayCuesAfterTrackLoaded(trackElem,track) {
  // Create a listener that will only be called once the track has
  // been loaded. We cannot display the transcript before
  // the track is loaded
   trackElem.addEventListener('load',function(e) {
      console.log("track loaded");
79.   displayCues(track);
   });
}
function disableAllTracks() {
  for(var i = 0; i < tracks.length; i++)
     // the track mode is important: disabled tracks do not fire
events
     tracks[i].mode = "disabled";
}

function displayCues(track) {
   // displays the transcript of a TextTrack
   var cues = track.cues;
92.
   // iterate on all cues of the current track
   for(var i=0, len = cues.length; i <len; i++) {
      // current cue, also add enter and exit listeners to it
      var cue = cues[i];
      addCueListeners(cue);

      // Test if the cue content is a voice <v speaker>....</v>
```

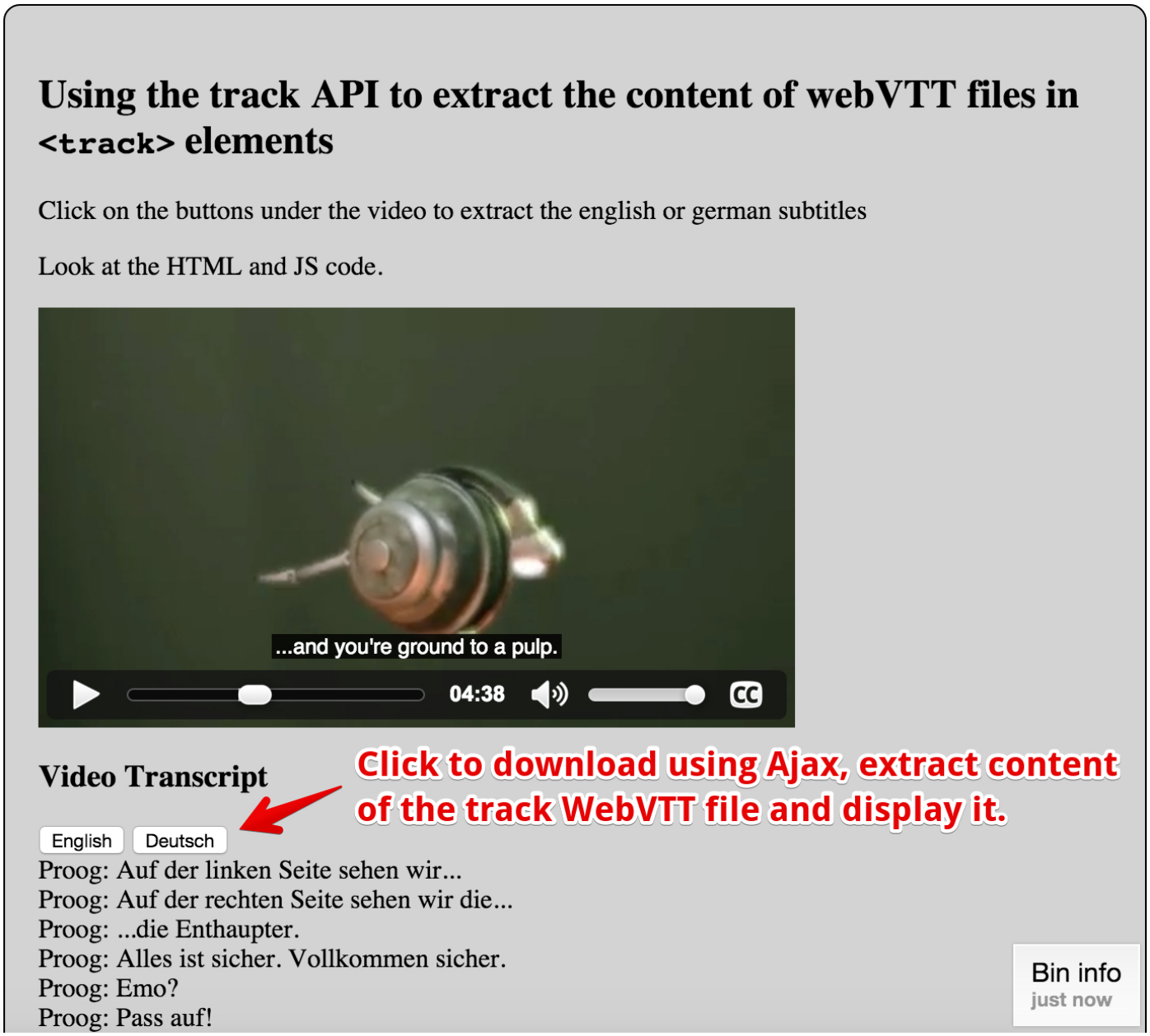
```
      var voices = getVoices(cue.text);
      var transText="";
      if (voices.length > 0) {
         for (var j = 0; j <voices.length; j++) { // how many voices?
            transText += voices[j].voice+ ': ' + removeHTML(voices[j].text);
         }
      } else
         transText = cue.text; // not a voice text
      var clickableTransText = "<li class='cues' id=" + cue.id
                               + " onclick='jumpTo("
                               + cue.startTime + ");'" + ">"
                               +transText + "</li>";

      addToTranscriptDiv(clickableTransText);
   }
}

function getVoices(speech) {
   // takes a text content and check if there are voices
   var voices = []; // inside
   var pos = speech.indexOf('<v'); // voices are like <v Michel> ....
   while (pos != -1) {
      endVoice = speech.indexOf('>');
      var voice = speech.substring(pos +2, endVoice).trim();
      var endSpeech =speech.indexOf('</v>');
      var text =speech.substring(endVoice + 1,endSpeech);
      voices.push({
          'voice': voice,
          'text': text
      });
      speech = speech.substring(endSpeech+ 4);
      pos = speech.indexOf('<v');
  }
  return voices;
}

function removeHTML(text) {
  var div =document.createElement('div');
  div.innerHTML = text;
  return div.textContent || div.innerText|| '';
}
```

```
function jumpTo(time) {
  // Make the video jump at the time position + force play
  // if it was not playing
  video.currentTime = time;
  video.play();
}

function clearTranscriptDiv() {
  transcriptDiv.innerHTML = "";
}

function addToTranscriptDiv(htmlText) {
  transcriptDiv.innerHTML += htmlText;
}

function addCueListeners(cue) {
  cue.onenter = function(){
     // Highlight current cue transcript by adding the
     // cue.current CSS class
     console.log('enter id=' + this.id);
     var transcriptText =document.getElementById(this.id);
     transcriptText.classList.add("current");
 };

cue.onexit = function(){
   console.log('exit id=' + cue.id);
   var transcriptText =document.getElementById(this.id);
   transcriptText.classList.remove("current");
 };
} // end of addCueListeners...
```

EXAMPLE 2: GETTING A WEBVTT FILE USING AJAX/XHR2 AND PARSE IT MANUALLY

This is an old example written in 2012 at a time when the track API was not supported by browsers. It downloads WebVTT files using Ajax and parses it "by hand". Notice the complexity of the code, compared to example 1 that uses the track API instead. We give this example as is. Sometimes, bypassing all APIs can be a valuable solution, especially when support for the track API was very sporadic, as was the case in 2012...

Here is an example at JSBin that displays the values of the cues in the different tracks:



This example, adapted from an example from (now offline) dev.opera.com, uses some JavaScript code that takes a WebVTT subtitle (or caption) file as an argument, parses it, and displays the text on screen, in an element with an `id` of transcript.

Extract from HTML code:

```
...
 <video preload="metadata" controls >
    <source src="https://..../elephants-dream-
medium.mp4" type="video/mp4">
    <source src="https://..../elephants-dream-
medium.webm" type="video/webm">
```

```
    <track label="English subtitles"kind="subtitles" srclang="en"
           src="https://..../elephants-dream-subtitles-
en.vtt" default>
    <track label="Deutsch subtitles"kind="subtitles" srclang="de"
           src="https://..../elephants-dream-subtitles-de.vtt">
    <track label="English chapters"kind="chapters" srclang="en"
           src="https://..../elephants-dream-chapters-en.vtt">
 </video>
 ...
   <h3>Video Transcript</h3>
   <buttononclick="loadTranscript('en');">English</button>
   <buttononclick="loadTranscript('de');">Deutsch</button>
    </div>
    <div id="transcript"></div>
...
```

JavaScript code:

```
// Transcript.js, by dev.opera.com
function loadTranscript(lang) {
   var url ="http://mainline.i3s.unice.fr/mooc/" +
       'elephants-dream-subtitles-' +lang + '.vtt';
   // Will download using Ajax + extract subtitles/captions
   loadTranscriptFile(url);
}

functionloadTranscriptFile(webvttFileUrl) {
   // Using Ajax/XHR2 (explained in detail in Week 3)
   var reqTrans = new XMLHttpRequest();

   reqTrans.open('GET', webvttFileUrl);
   // callback, called only once the response is ready
   reqTrans.onload = function(e) {
       var pattern = /^([0-9]+)$/;
       var patternTimecode = /^([0-9]{2}:[0-9]{2}:[0-9]{2}[,.]{1}
[0-9]{3}) --\> ([0-9]
                              {2}:[0-9]{2}:[0-9]{2}[,.]{1}[0-9]{3})
(.*)$/;
       var content = this.response; // content of the webVTT file
       var lines = content.split(/\r?\n/); // Get an array of text
lines
       var transcript = '';
```

```
        for (i = 0; i < lines.length; i++){
          var identifier =pattern.exec(lines[i]);
          // is there an id for this line, if it is, go to next line
          if (identifier) {
            i++;
            var timecode =patternTimecode.exec(lines[i]);
            // is the current line a timecode?
            if (timecode && i <lines.length) {
               // if it is go to next line
               i++;
               // it can only be a text line now
               var text = lines[i];

               // is the text multiline?
               while (lines[i] !== '' && i< lines.length) {
                  text = text + '\n' +lines[i];
                  i++;
               }
               var transText = '';
               var voices =getVoices(text);
               // is the extracted text multi voices ?
               if (voices.length > 0) {
                  // how many voices ?
                  for (var j = 0; j <voices.length; j++) {
                  transText +=voices[j].voice + ': '
                            +removeHTML(voices[j].text)
                            + '<br />';
               }
            } else
               // not a voice text
               transText = removeHTML(text)+ '<br />';
          transcript += transText;
        }
      }
      var oTrans =document.getElementById('transcript');
      oTrans.innerHTML = transcript;
    }
  };
 reqTrans.send(); // send the Ajax request
}

function getVoices(speech) {  // takes a text content and check if
there are voices
  var voices = [];             // inside
```

```
  var pos = speech.indexOf('<v'); // voices are like <v Michel>
....
  while (pos != -1) {
    endVoice = speech.indexOf('>');
    var voice = speech.substring(pos + 2,endVoice).trim();
    var endSpeech =speech.indexOf('</v>');
    var text = speech.substring(endVoice+ 1, endSpeech);
    voices.push({
       'voice': voice,
       'text': text
    });
    speech = speech.substring(endSpeech +4);
    pos = speech.indexOf('<v');
  }
  return voices;
}

function removeHTML(text) {
  var div =document.createElement('div');
  div.innerHTML = text;
  return div.textContent || div.innerText|| '';
}
```