

Rendering of subtitles with imscJS

03.02.2018, FOSDEM 2018

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Immersive accessibility

Partners: **i2cat**, **rbb**, **MOTION SPELL**, **UAB**, **IIT**, **University of Salford MANCHESTER**, **RNIB Supporting people with sight loss**, **ANGLATECNIC**, **PROTECHNO**

Funded by: 

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 761974.

What is IMSC?

- Internet Media Subtitles and Caption
- Subset of TTML
- Superset of EBU-TT-D

imscJS – IMSC to HTML5



- Javascript, BSD2
- TTML Renderer
- IMSC 1 text + image

imscJS Project



<https://github.com/sandflow/imscJS>

Author: Pierre Lemieux

Sponsor: MovieLabs

imscJS Use Cases

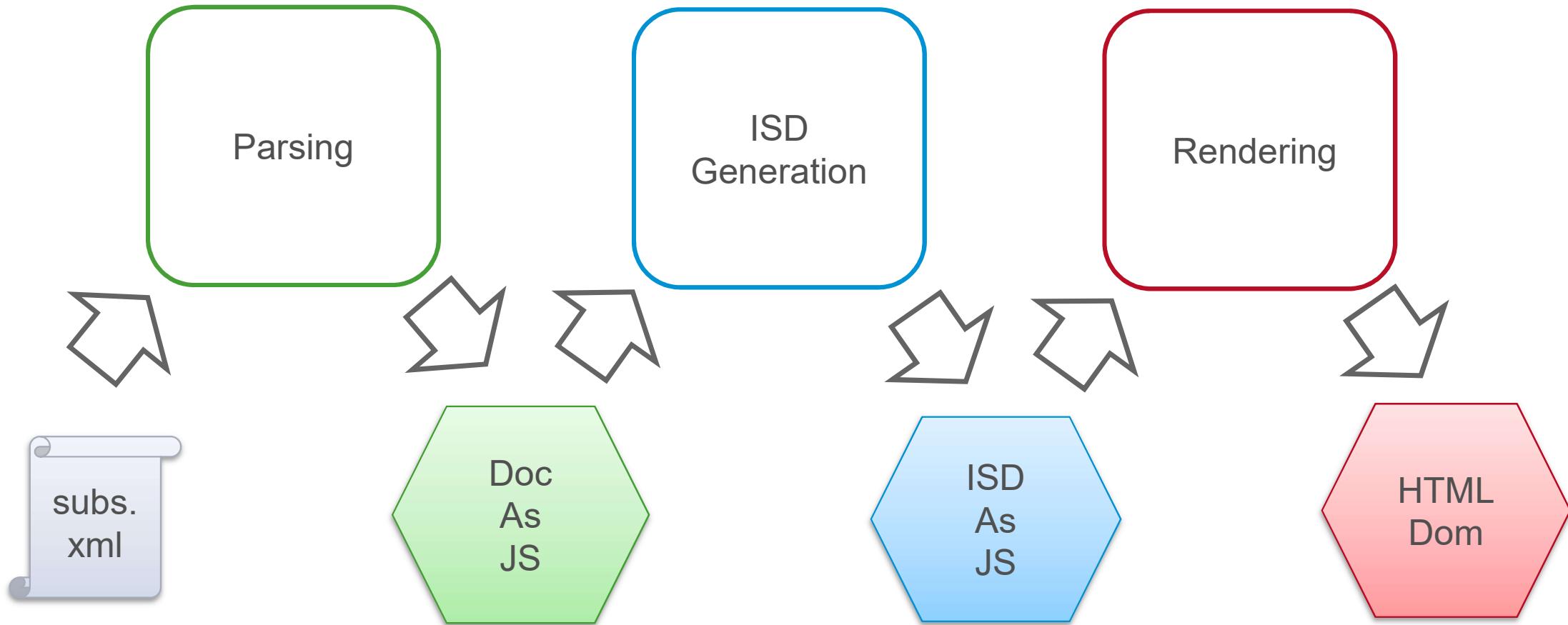
- Reference Implementation
- HTML5 Polyfill
- Toolbox

imscJS as Reference Implementation

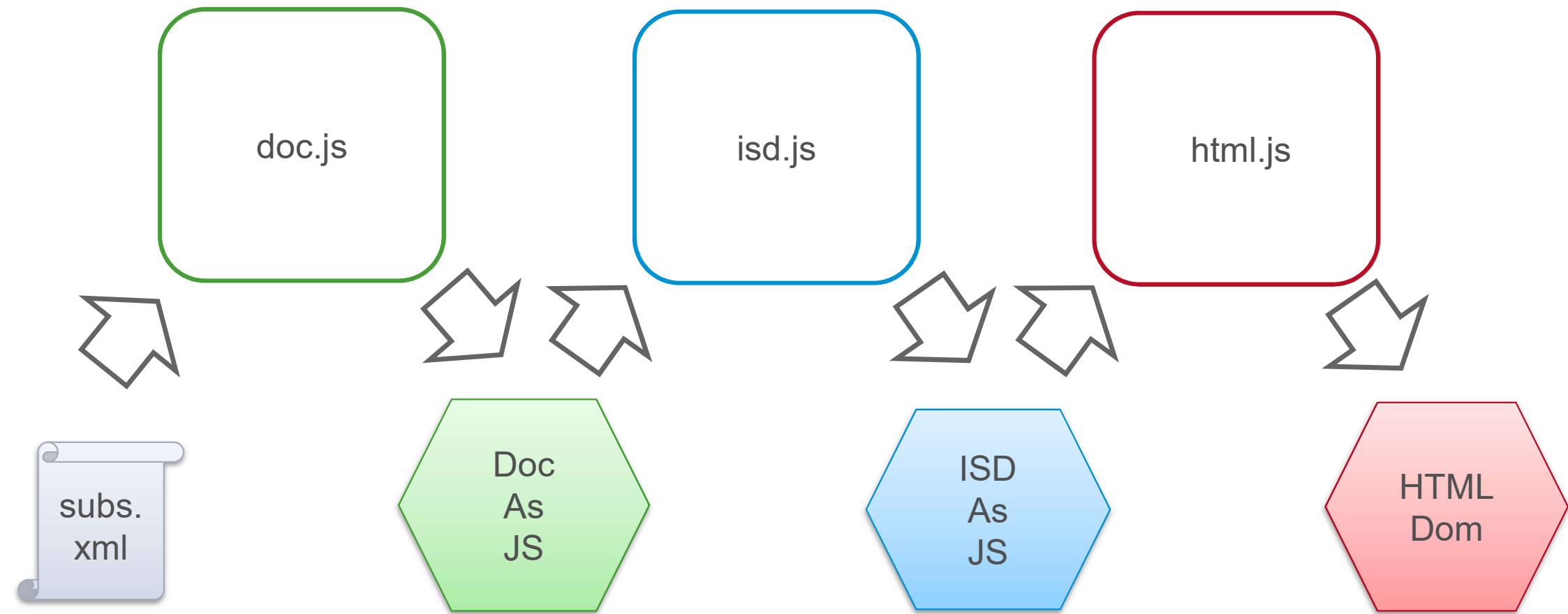
Value

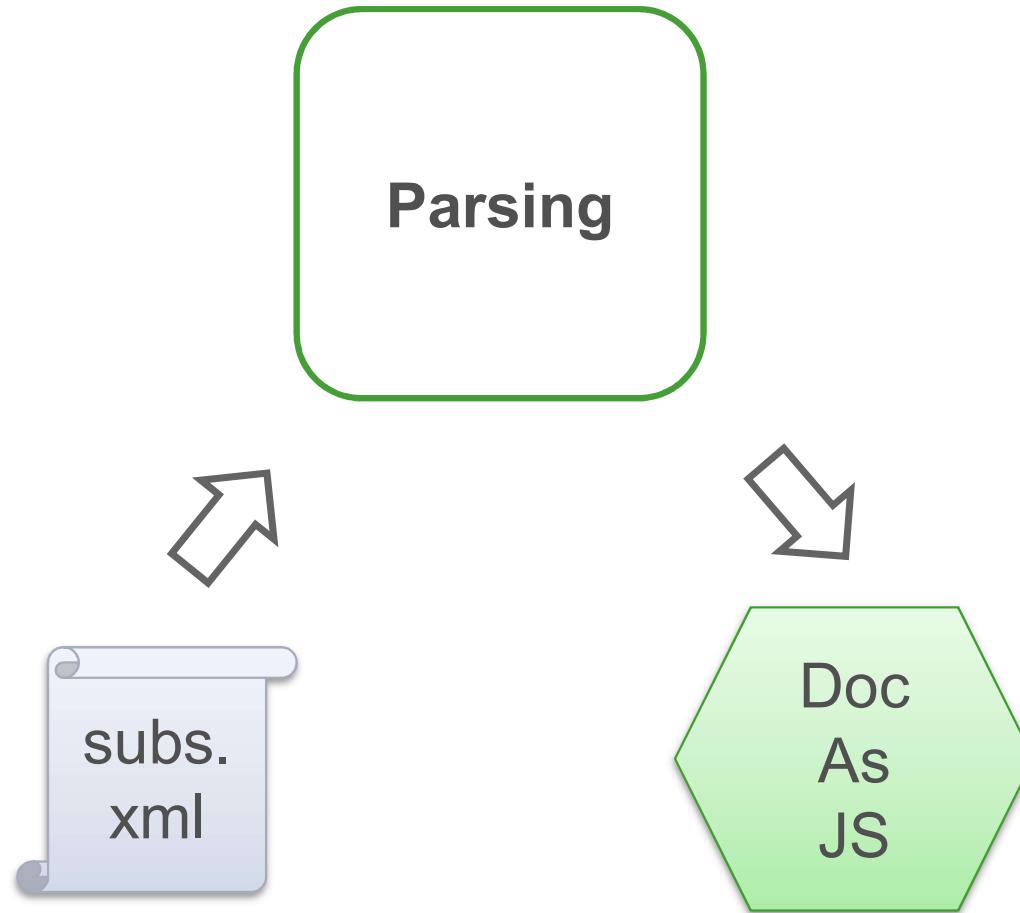
- Reference output
- Guidance
- Integration

Steps



Steps





Parsing

```
var doc = "<tt>...</tt>";
```

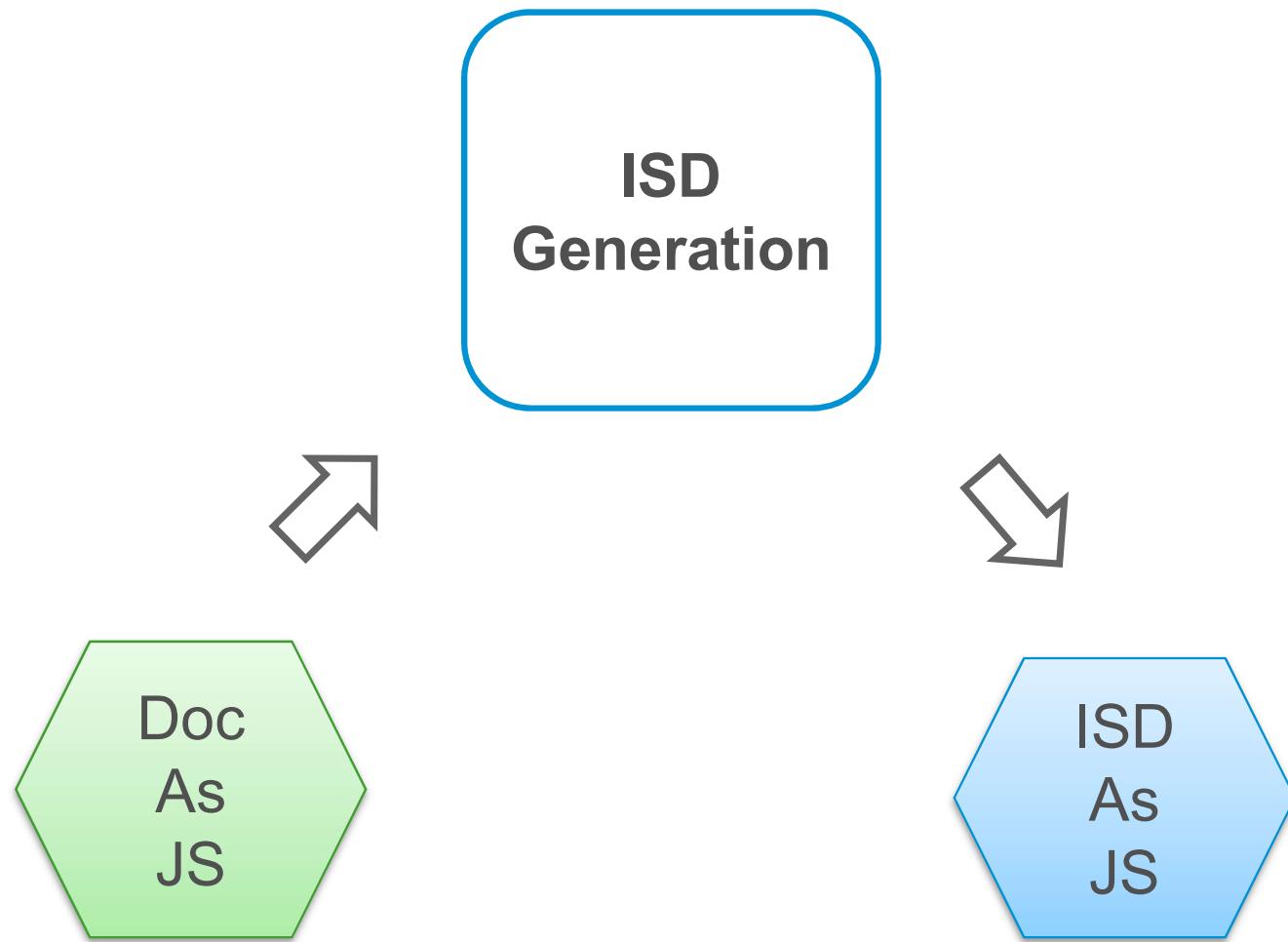
```
var docJs = imsc.fromXML(doc);
```

Parsing

```
<p begin="00:00:00.000" end="00:00:02.000">  
    Hello World  
</p>
```



```
▼ contents: Array(1)  
  ▼ 0: P  
    begin: 0  
    ► contents: [AnonymousSpan]  
    end: 2  
    kind: "p"  
    regionID: "bottom"
```



ISD =

Intermediate Synchronic Document

Why ISD?

```
<p>  
  <span begin="0s" end="3s">l </span>  
  <span begin="1s" end="3s">am</span>  
  <span begin="2s" end="3s">at fosdem</span>  
</p>
```

Why ISD?

<math><1>I</1></math>

<math><1>I \text{ am}</1></math>

<math><1>I \text{ am at Fosdem}</1></math>

$0s$

$1s$

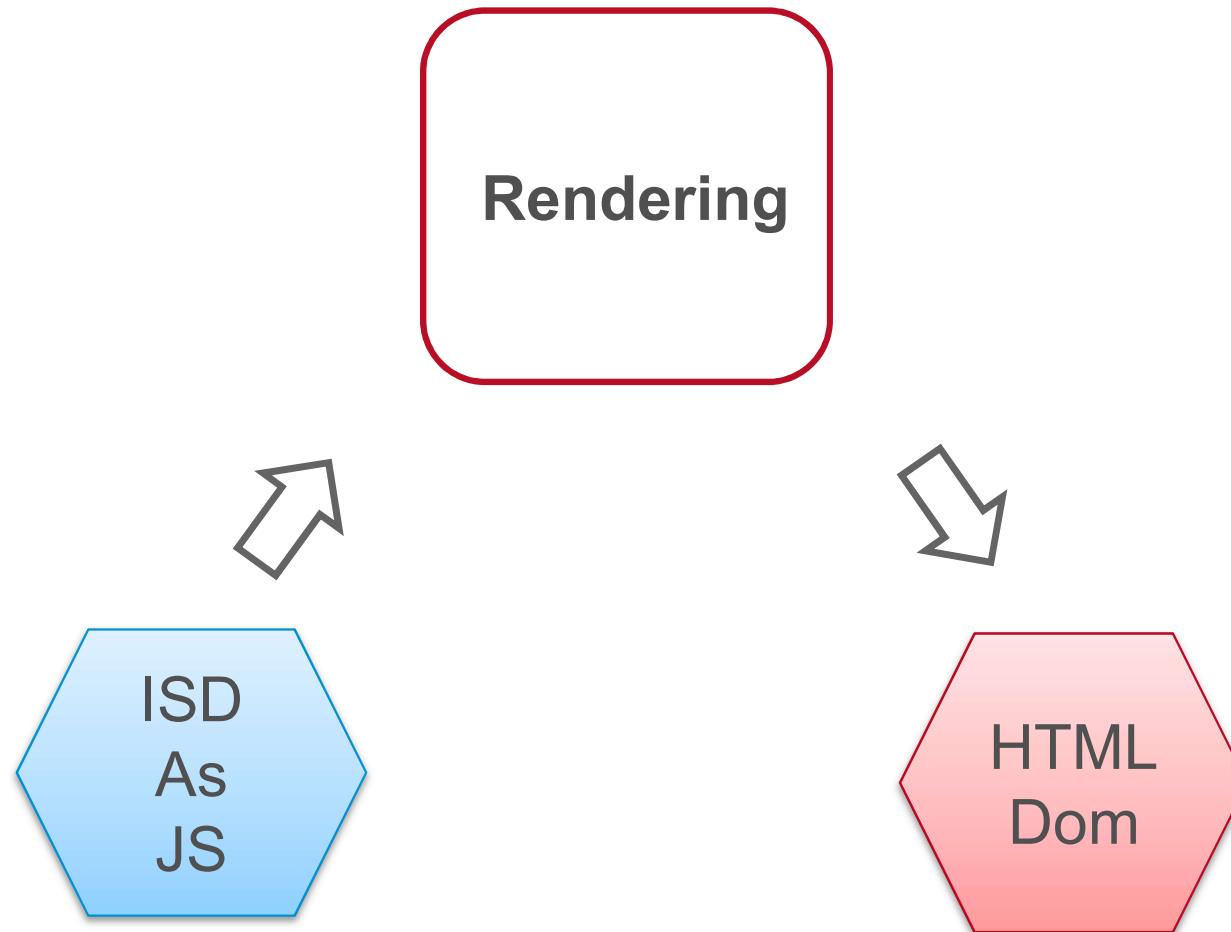
$3s$

ISD Generation

```
var isd0 = imsc.generateISD(docJs, 0);  
  
var isd1 = imsc.generateISD(docJs, 1);  
  
Var isd2 = imsc.generateISD(docJs, 2);
```

ISD Generation

```
▼ contents: Array(1)
  ▼ 0: P
    begin: 0
    ► contents: [AnonymousSpan]
      ↓
▼ 0: ISDContentElement
  ▼ contents: Array(1)
    ► 0: ISDContentElement {kind: "span", styleAttrs: {...}, text: "Hello World"}
      length: 1
    ► __proto__: Array(0)
    kind: "p"
  ▼ styleAttrs:
    ► http://www.w3.org/ns/ttml#styling backgroundColor: (4) [0, 0, 0, 0]
```



Rendering

```
var e = document.createElement("div");  
  
var r = imsc.render(isd0, e, 800, 600);
```

Rendering

```
▼<p style="margin: 0px; background-color: rgba(0, 0, 0, 0); direction: ltr; line-height: 32.96px; text-align: left; unicode-bidi: normal; visibility: visible;">
  <span style="margin: 0px; background-color: rgba(0, 0, 0, 0); color: rgb(255, 255, 255); direction: ltr; font-family: Verdana, Arial, Tiresias; font-size: 32px; font-style: normal; font-weight: normal; text-decoration: none; unicode-bidi: normal; visibility: visible; white-space: normal;">Hello World</span>
</p>
</div>
```

imscJS as HTML5 Polyfill

imscJS as HTML5 Polyfill

```
// v = video element
var t = v.addTextTrack('subtitles',
                      'Demo',
                      'en');

var c = new VTTCue('0', '2', '');
```

imscJS as HTML5 Polyfill

```
c.onenter = function() {  
    var isd = imsc.generateISD(docJs,  
                               this.startTime);  
    imsc.renderHTML(isd, e);  
};  
  
c.onexit = function() { //remove imsc html }
```

imscJS as HTML5 Polyfill

```
//Adding IMSC Cue to TextTrack  
t.addCue(c);
```

imscJS as Toolbox

Using imscJS as Toolbox

- Manipulate ISD directly
- Pre-generate HTML fragments (node.js + jsdom)
-

imscJS in Operation

DASH.js



subtitling.irt.de/cmaf/

BR Live Service as recorded loop



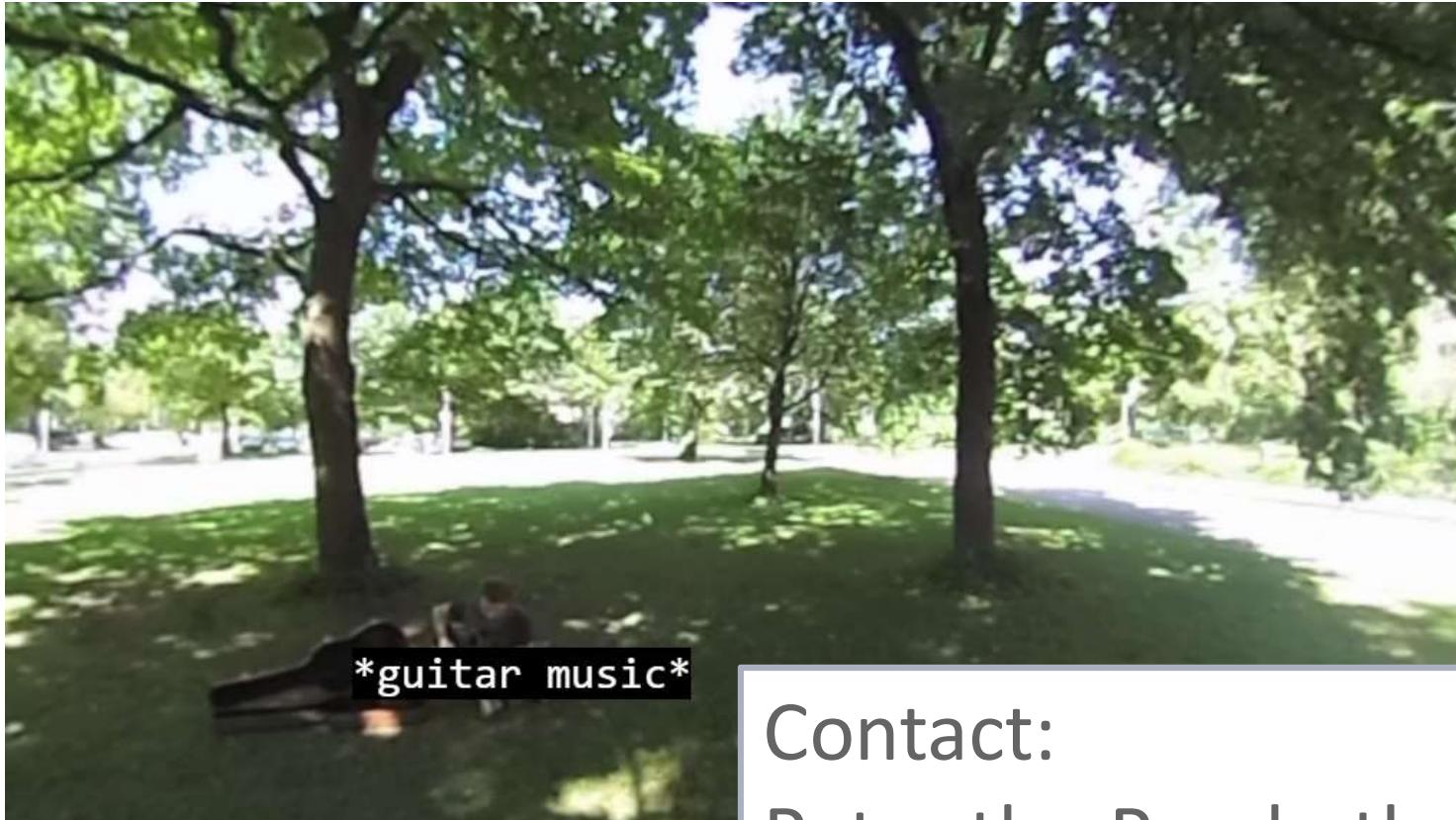
360 Degree subtitles in ImAc



360 Degree subtitles in ImAc



360 Degree subtitles in ImAc



Contact:
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Links

IMSC Specification

<https://www.w3.org/TR/ttml-imsc1/>

imscJS

<https://github.com/sandflow/imscJS>

Timed Text Tooklit

<https://github.com/skynav/ttt>

EBU-TT Live Toolkit

<https://github.com/sandflow/imscJS>

Subtitle Conversion Framework

<https://github.com/IRT-Open-Source/scf>

Thanks!

Experts in audio-visual media

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