Common Issues

Distribution

Packaging

Synchronization

Reusability

Cross Platform/Device Compatibility

Put stuff in MP4 containers

Distribution	Progressive, Adaptive, Offline….
Packaging	1 File
Synchronization	Frame-accurate
Reusability	Put everything in MP4
Cross Platform/Device Compatibility	WCS: video will be available

A bit of history...

Timeline

2014: MP4Box.js project started - support for multi-track mp4 files

2015: XML document delivery @ XML Prague *acc. ~ 250ms*

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GPAC Project on Advanced Content
an open source cross-platform multimedia framework

MP4Box packaging solution

- Packaging into ISO file formats

- XML/X3D/SVG/WYCI support
  (using NHML descriptors)

- DASH-ready content

MP4Box.js browser library

- Exposes information of MP4 files

- Extract samples from MP4 (timed data)

- Extract (non-timed) assets from MP4

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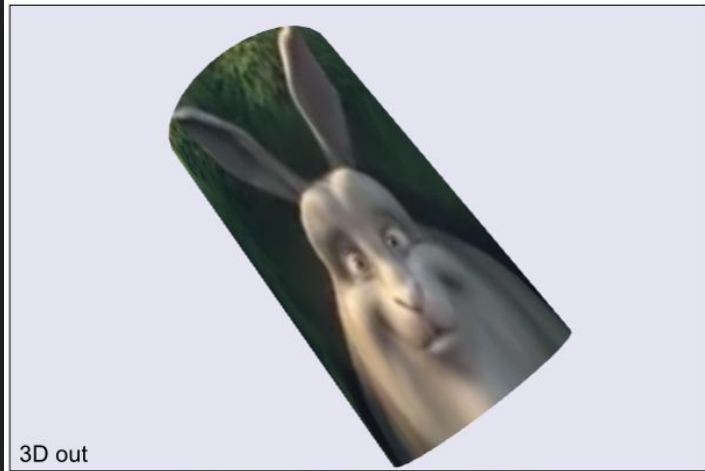2015: **Synchronized delivery of 3D Scenes with AV @ Web3D** *acc. ~ 200ms*

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Delivery of 3D Scenes with Audio and Video

3D out

video out

3D out

video out

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MP4Box.js / ISOBMFF Box Structure Viewer (see also File Player)

Load: Example ▾   Video with many web assets (JS, CSS, PNG, WebVTT) ▾   Load   Loading Completed!

| File Overview | Box View | Sample View | Item View |

ID	Name	Type	Primary	Protected	Byte ranges	References [type, item ID]
1	index.html	text/html	Yes	No	[76588-77406]	
2	assets/chess_script.js	text/javascript	No	No	[77407-77934]	
3	assets/script.js	text/javascript	No	No	[77935-81287]	
4	assets/cues.vtt	text/vtt	No	No	[81288-85510]	
5	assets/chessboardjs/www/css/chessboard.css	text/css	No	No	[85511-86888]	
6	assets/chessboardjs/www/js/chessboard.js	text/javascript	No	No	[86889-132722]	
7	assets/chessboardjs/www/js/jquery-1.10.1.min.js	text/javascript	No	No	[132723-225745]	
8	assets/chessboardjs/www/js/jquery.color.min.js	text/javascript	No	No	[225746-232511]	
9	assets/chessboardjs/www/js/json3.min.js	text/javascript	No	No	[232512-239881]	
10	assets/chessboardjs/www/img/board-background.png	image/png	No	No	[239882-240418]	
11	assets/chessboardjs/www/img/chesspieces/wikipedia/bB.png	image/png	No	No	[240419-241823]	
12	assets/chessboardjs/www/img/chesspieces/wikipedia/bK.png	image/png	No	No	[241824-244832]	
13	assets/chessboardjs/www/img/chesspieces/wikipedia/bN.png	image/png	No	No	[244833-246707]	
14	assets/chessboardjs/www/img/chesspieces/wikipedia/bP.png	image/png	No	No	[246708-247484]	
15	assets/chessboardjs/www/img/chesspieces/wikipedia/bQ.png	image/png	No	No	[247485-250132]	
16	assets/chessboardjs/www/img/chesspieces/wikipedia/bR.png	image/png	No	No	[250133-250880]	
17	assets/chessboardjs/www/img/chesspieces/wikipedia/wB.png	image/png	No	No	[250881-253254]	
18	assets/chessboardjs/www/img/chesspieces/wikipedia/wK.png	image/png	No	No	[253255-256077]	
19	assets/chessboardjs/www/img/chesspieces/wikipedia/wN.png	image/png	No	No	[256078-258465]	
20	assets/chessboardjs/www/img/chesspieces/wikipedia/wP.png	image/png	No	No	[258466-260036]	
21	assets/chessboardjs/www/img/chesspieces/wikipedia/wQ.png	image/png	No	No	[260037-263848]	
22	assets/chessboardjs/www/img/chesspieces/wikipedia/wR.png	image/png	No	No	[263849-264945]	

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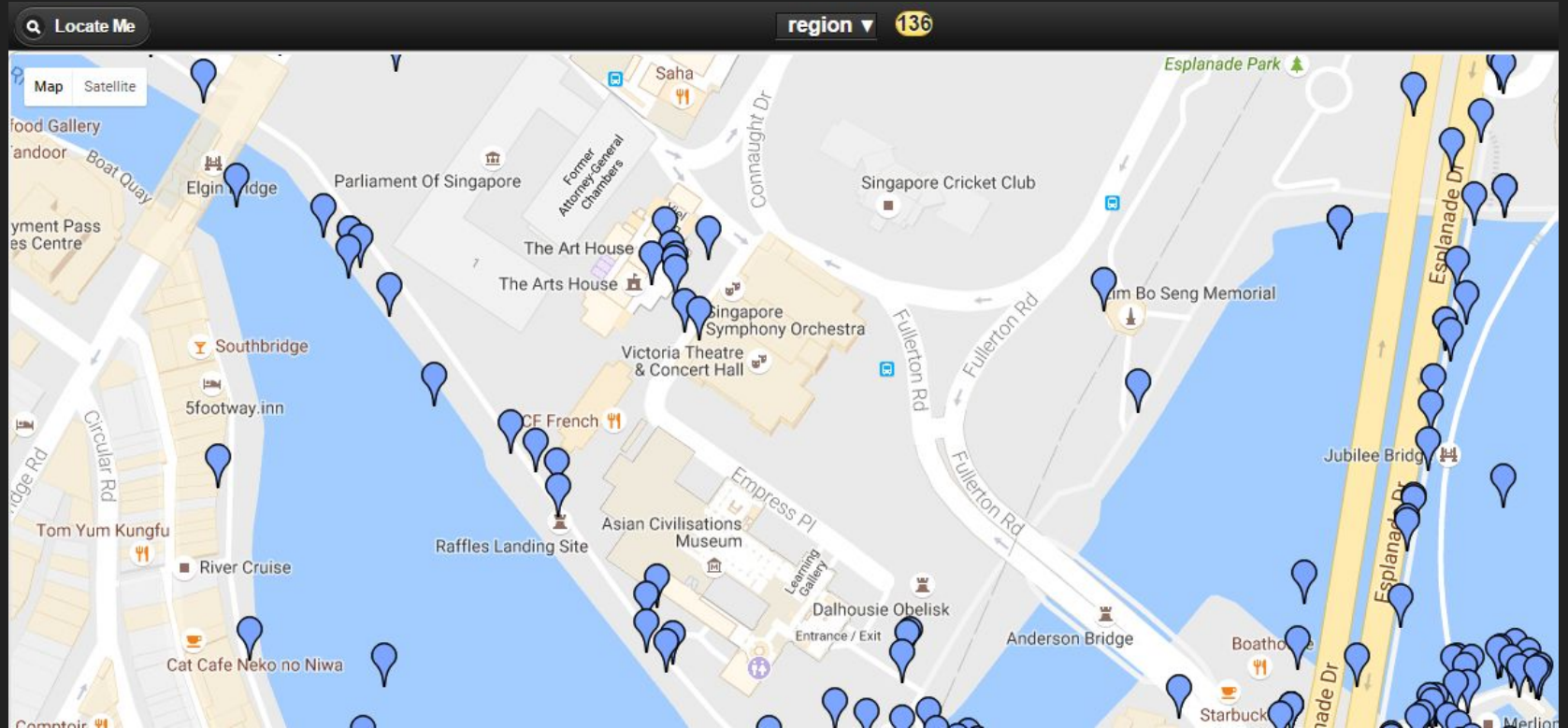
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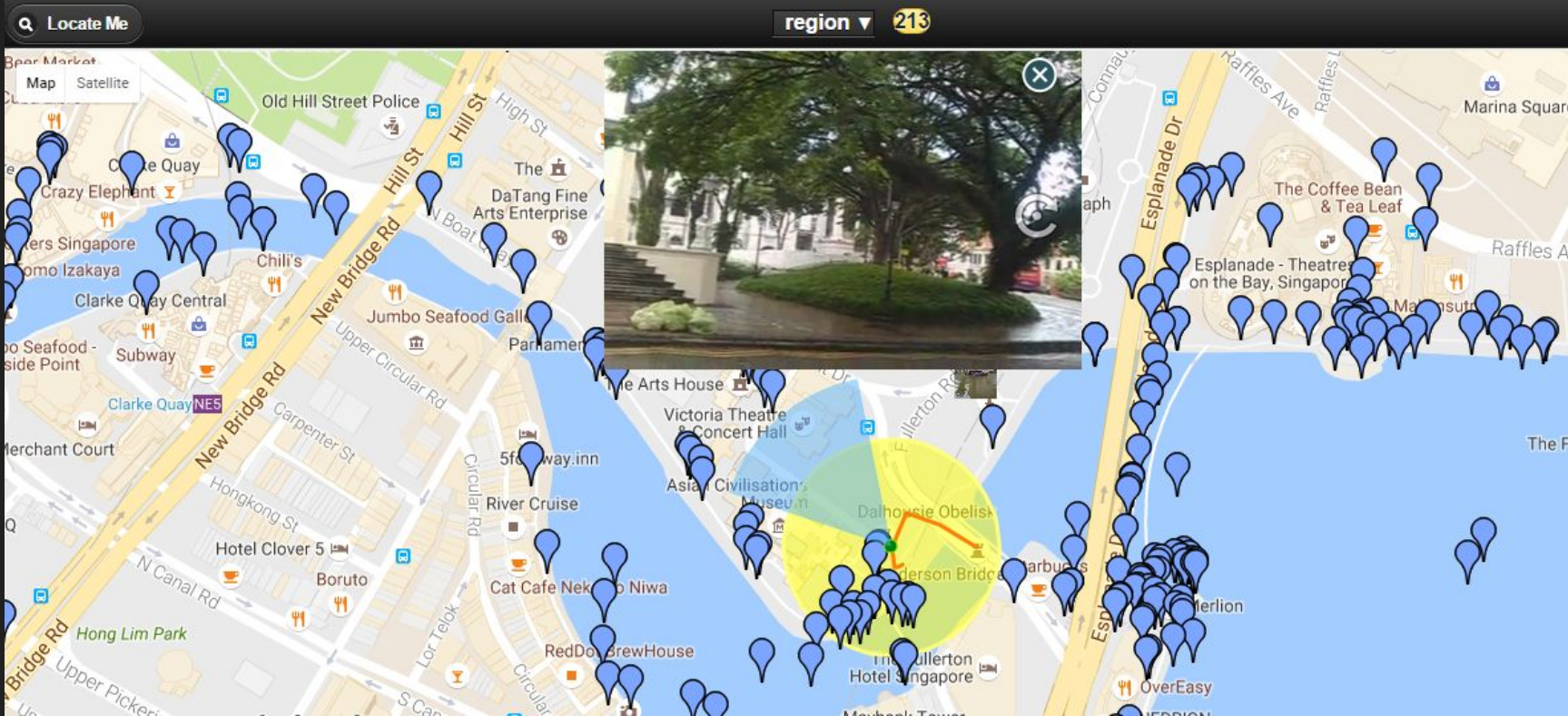2016: **Enhanced video navigation (startof) @ The Graphical Web**

2017: Actual enhanced video navigation (hopefully) @ The Graphical Web

The Original Approach

GeoVid (MediaQ) Project

GeoVid

Our take

Architecture Overview

- **Android App**
  - Position (GPS, Accelerometer, Magnetic Field, Gyroscope) sensor recording
  - Camera characteristics and environmental sensors recording
- **Server/Parser**
  - Cleanup / Synch / Transform recordings
  - Encode / Package / Distribute
- **Web Client**
  - Use indications for Orientation (instead of actual FOV)
  - Gyroscope-based orientation
  - Sensor fusion (Acc+Mag) fallback
  - Custom polling mechanism for synchronization

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Current Work

- Colour-coded markers
- Show/hide non-key markers according to zoom level
- Highlight active marker
- Add frame preview on hover
- Options for displaying: GPS accuracy, FOV, per-user recordings etc.

Future work

- Indicate relevant videos on recording preview
- AR video browsing
- Dynamically create video stories on playback
- **Scenario-based delay time, synchronization and timing accuracy**
    - ○ *On-demand*: **a few seconds accuracy - high delay**
    - ○ *Live*: **a few milliseconds accuracy - low delay**
    - ○ *Critical*: **hardware-bound accuracy - high delay**
- Move from Google Maps (?)
- MPEG
- User studies

Thank you

Questions?
Suggestions?

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