Media Element accuracy and DOM synchronization

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About Grabyo

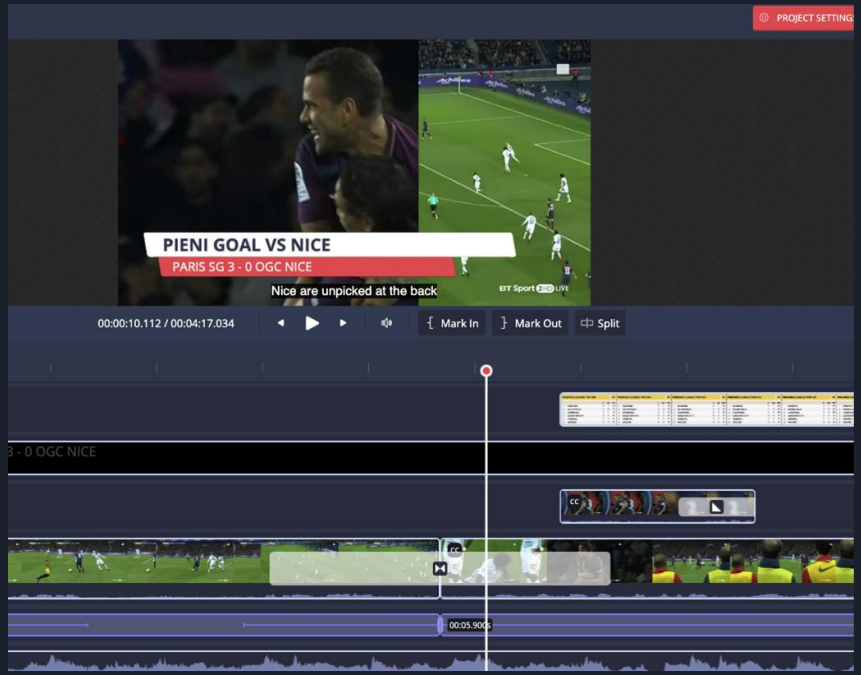
Grabyo is a SaaS platform for broadcast media production aimed at commercial broadcasters.

- Live broadcast production
- Video editing
- Clipping from live streams
- Publishing

Frame accuracy

Frame accuracy - Example scenarios

- Video editing
- Trimming just before/after camera cut
- Seeking 1 frame at a time
- Smooth scrubbing



Frame accuracy

- HTMLVideoElement does not expose frame-accurate time data
- Unable to guarantee frame-accurate reproduction of a selection in a different application
- Could expose PTS, High Resolution Timestamp or frame number getters and setters
- Previous implementations removed due to security and never replaced

DOM synchronization

- Progress bars
- Audio Monitoring
- Graphical Overlays
- Synchronising media
- Sequencing media

DOM synchronisation

- Playback progress is not linked to the DOM
- Best effort using window.requestAnimationFrame
- Timeupdate event lacks precision
- DOM thread bottlenecking

Codecs

Improved codec support and lower-level decoding interfaces can enable novel workflows. Bring on WebCodecs!

- Intraframe coding for fast seeking
- Storing specific time ranges for fast referencing
  - Non-linear editing workflows
- Generating thumbnails and audio waveforms
- Embedding metadata e.g. PTS
- Proprietary error correction

Multi-threading

Performance is key for user experience in resource-intensive workflows.

- OffscreenCanvas
  - Render from WebGL to canvas in a Worker
- Proposed OffscreenVideo
  - Draw from a video to a canvas inside a worker
  - Allow data capture and manipulation without touching the main thread

Thank you!