Streaming of Kinect Data for Interactive In-Browser Audio Performances

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Built with **GPAC**

EXAMPLE USE CASE SPECIFICATIONS

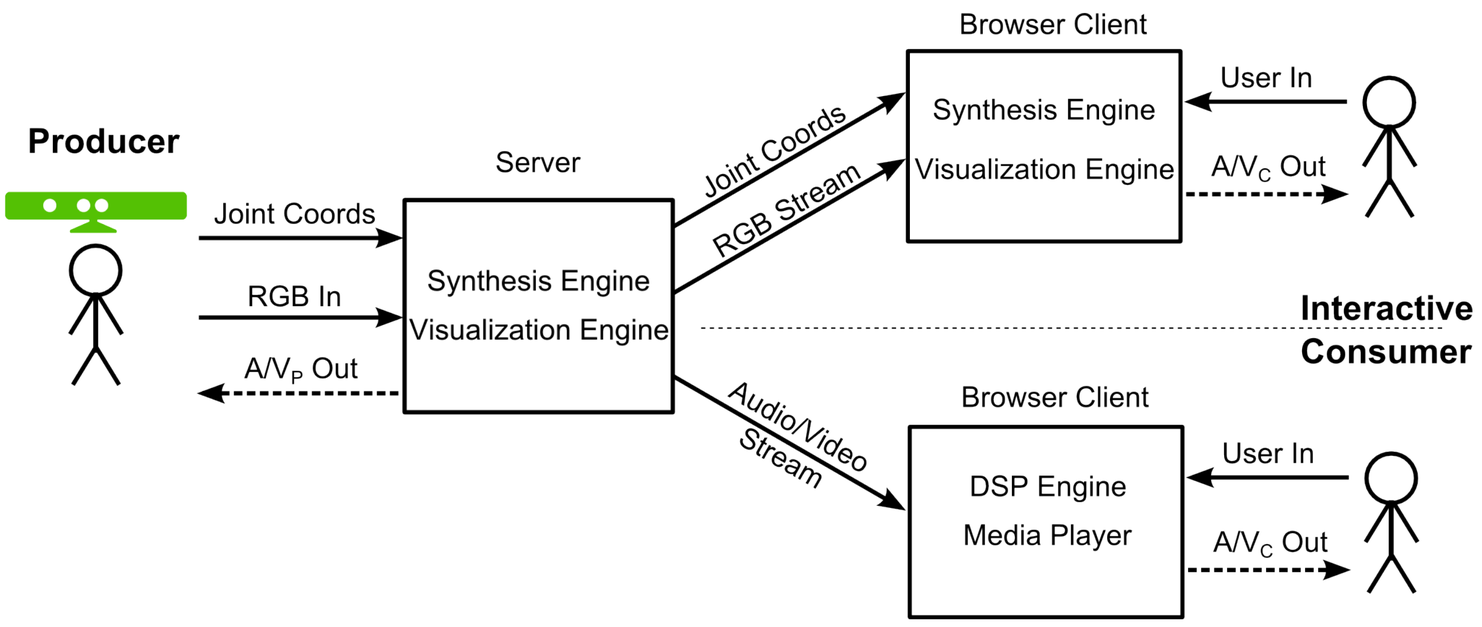
- Producer creates sounds using a controller (Kinect), with a synthesis and effects engine, accompanied by input-based visualizations
- Auditory feedback to the Producer for monitoring purposes

… AND REQUIREMENTS

- Rhythm and tonality should be locked for the Consumer
- Control over the effects (Reverb, Stereo Panning) by the Consumer
- Control over the visualizations by the Consumer

CURRENT APPROACHES

1. Forwarding the Inputs to the Client



Pros:
- ✔ Light network load
- ✔ Support for sophisticated visualizations [2]

Cons:
- ✖ Full control over the output by the Consumer
- ✖ Requires musical and programming competencies by the Consumer

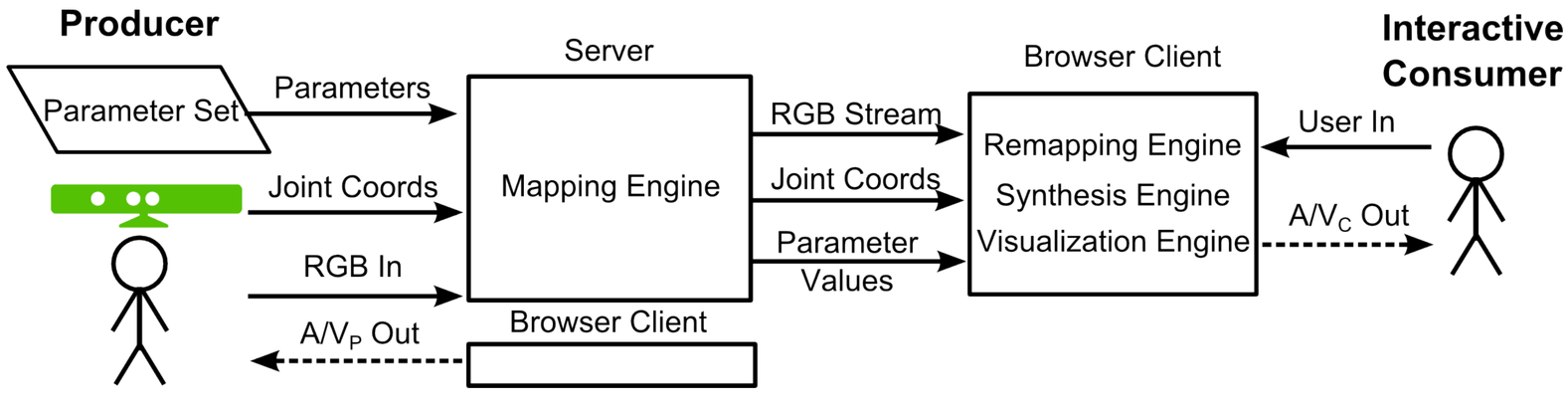
Pros:
- ✔ Transmitted A/V is the final stream

Cons:
- ✖ Zero control over the output by the Consumer
- ✖ Computationally expensive DSP algorithms should be applied for any audio or visualization modifications

2. Sending the A/V Output to the Client

THE PARAMETER SET APPROACH

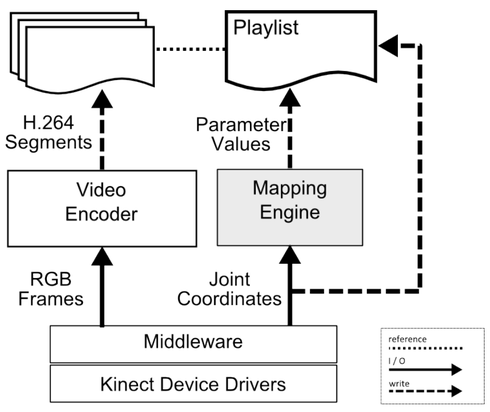
Using a Parameter Set[1], with Locks



Pros:
- ✔ Preserve rhythm and tonality
- ✔ User-friendly remapping used for any modifications
- ✔ Support for sophisticated visualizations [2]
- ✔ Light network load
- ✔ No DSP required for visualization editing

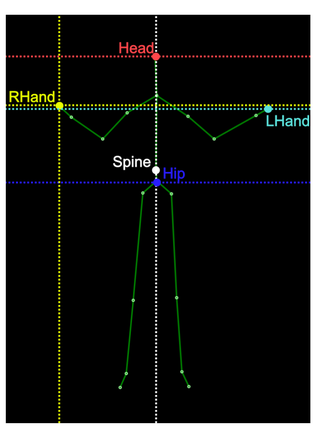
Cons:
- ✖ System complexity
- ✖ Adaptive streaming delivery systems (e.g. MPEG-DASH) can add server-side delay

DATA HANDLING



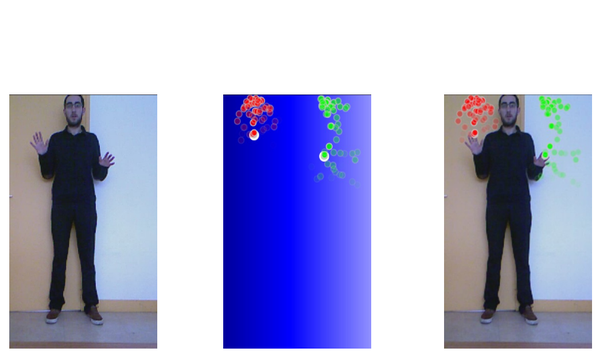
SAMPLE PARAMETER SET

Parameter	Joint	Min. (mm)	Max. (mm)	Locked
Frequency	Rhand Y	Hip Y	Head Y	YES
Volume	Rhand X	RS X - 300	RS X + 900	YES
Panning	Spine X	-1500	+1500	NO
Reverb	Lhand Y	Hip Y	Head Y	NO



Skeleton reference

SAMPLE VISUALS



video canvas mixed

References

[1] E. Potetsianakis, E. Ksylakis and G. Triantafyllidis, "A Kinect-based Framework for Better User Experience in Real-Time Audiovisual Content Manipulation," Telecommunications and Multimedia (TEMU), 2014 International Conference on, Heraklion, 2014, pp. 238-242.

[2] Cyril Concolato, Jean Le Feuvre, and Emmanouil Potetsianakis. 2015. “Synchronized Delivery of 3D Scenes With Audio and Video”. In Proceedings of the 20th International Conference on 3D Web Technology (Web3D '15). ACM, New York, NY, USA, 245-248.

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