Remastering of movie soundtracks into immersive 3D audio

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We have seen blender for graphics modeling, animation, rendering, games... we use it for doing **audio**!



Introduction

- In the era of 3D cinema, the audio is still basic (5.1)
- The goal: immersive experiences



22.2 standardized by NHK

Amsterdam, Blender conference Oct 24th 2009



Introduction

- The BM audio lab
 - Software engineers, physicians, sound designers
- What we do: 3D audio
- Develop an open source audio framework: CLAM





15 loudspeakers in a sphere at Barcelona Media



CLAM audio effects prototyping



http://clam-project.org





3D soundtracks: ideal tools

- A Digital Audio Workstation (DAW) that copes both with audio tracks and 3D scenes.
 - With powerful 3D modeling capabilities
 - With video support
 - \rightarrow So why not use Blender for that?
- An audio workflow agnostic to the number of loudspeakers and layout.
- The system should offer immediate auditory **feedback**.
- The ability to do high-quality (offline) rendering for room acoustics simulation.



We have a movie with it's soundtrack session: How do we create a 3D immersive version?









Auditory scene authoring





- **Goal**: create a simplified scene mimicking the target movie
- 1st, model the static references in Blender
- 2nd, (optional) add information about acoustic materials for reverb simulation
- 3nd, animate objects referring to audio sources and camera/listener
 - Side-by-side check with the video
- 4rd, relate sound objects to audio tracks in Ardour
- 5th, (optional) choose the 3D decoding algorithm to be used for each sound object





Sound design

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Merging the scene into Ardour





Merging the scene into Ardour

- Goal: incorporate the audio scene into Ardour so it can spatialize the tracks
- It is an automatic process
- Scene sources animation → automation controls for 3D audio decoders plugins
 - Transforming to listener's relative angles and distances
- The Ardour session (XML) is set up adding
 - 3D decoding plugins
 - The necessary routing and extra buses (e.g. 22 channel buses)
- It supports A/B tracks for concatenating takes with crossfades





Fine tuning





- Goal: give all the power to the audio engineer
- Edit the audio (gains, effects,...)
- Edit the spatialization (direction, distance,...)
- ... while listening to it





Playout to any layout



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Conclusions



- The workflow is quick and cheap (not a radical change)
 - Examples produced: Pinoccio 3K, Starwars, Ryan, 3D music...
- The content produced is future proof. Play it at your home and at your dome!
- Blender (and Ardour and open-source in general) has helped a lot!
- We want to know the blender community
- We also make use of the game engine for similar apps (YoFrankie! extensions with 3D-sound presented in LAC2009, see CLAM web)



Future work

- There is a need for timehead synch b/t Blender and Ardour
- Allow for interactive scene editing with audio monitoring
- Improve merging process
- Lots of things to be improved these are just the first steps



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