Monsters in the Orchestra, a Surround Computing VR Experience

Rémi Arnaud
Advanced Micro Devices
Sunnyvale, CA, USA
remi.arnaud@amd.com

Bill Herz
Advanced Micro Devices
Sunnyvale, CA, USA
bill.herz@amd.com

Emmanuel Marquez
Advanced Micro Devices
Sunnyvale, CA, USA
emmanuel.marquez@amd.com

1. Summary

Monsters in the Orchestra (MITO) is an interactive and immersive concert experience, utilizing breakthrough graphics, audio, and gesture technology driving state of the art VR headsets.

AMD showcased MITO at CES 2014 in the form of a dome. This cutting edge technology is now mapped to VR devices.

2. Description

Monsters in the Orchestra is an interactive and immersive demonstration of surround computing as experienced in a VR environment. Spectators are taken away to a stereoscopic world of monsters playing real world instruments with positional audio and 3D x 360 degree gesture control. The original MITO demonstrated at CES 2014 was created for spectators to be fully immersed in a 30' diameter dome driven by 6 HD projectors creating a 360 degree view, from floor to apex. Real time positional audio was introduced via hidden 32.4 speakers in three rings at different heights. Audio equalization and reverb was processed using AMD True Audio. The monsters were conducted or controlled by a human conductor using 3D x 360 degree gestures.

Figure 1. *MITO CES 2014*

For SigGraph 2014 Emerging Technology, spectators will be immersed in the same experience using Virtual Reality headsets such as those from Sony and Oculus, and 3D spacialized audio delivered to each spectator using stereo headphones. Unlike the dome experience, spectators will be able to interact with the monsters via simple gesture of both hands. Additionally, all VR spectators will be sharing the same experience (concert) visually

and aurally, but with unique perceptions based on their movement and position.

This is made possible by having the computer systems linked by a network for a synchronized experience. The net effect is that all spectators can share the same experience as a group as if they were all physically sitting in the same dome.
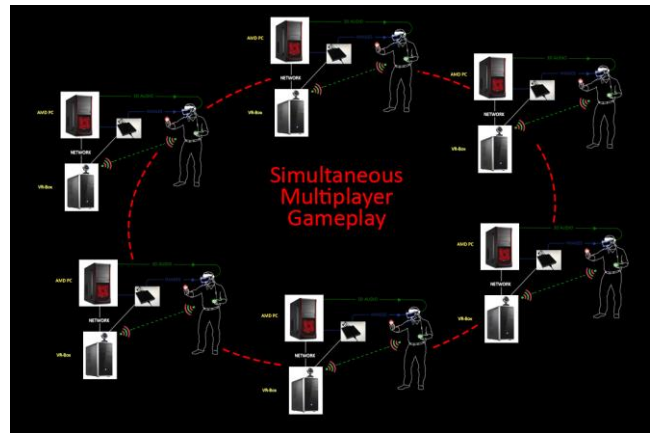

Figure 2. *Shared experience*

The performance of Monsters in the Orchestra is based on original visual and musical assets. 72 original instruments are mapped to the 19 monster musicians. The monsters are able to move to any location in 3D space with the audio moving accordingly.

Spectators control and experience a 5-minute concert given by monsters. In addition to the audio and animation tight synchronization, spectators will be able to localize the monster's positions based on the instrument's position, despite only using stereo headphones. As the monster and respective instruments move in position, the sound tracks.
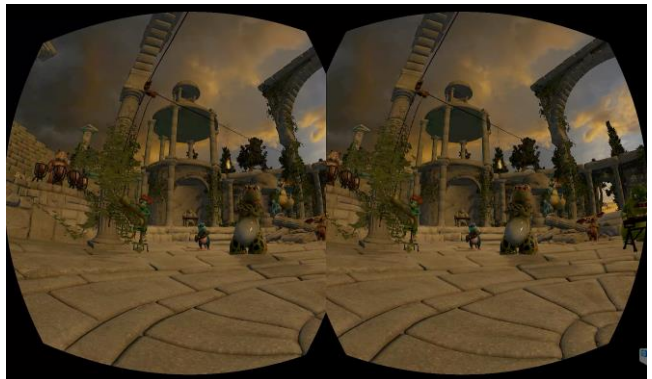

Figure 3. *MITO SIGGRAPH 2014*