

GENELEC®

CASE STUDY

Spatial studies

GENELEC MONITORS
POWER RESEARCH AT
HUDDERSFIELD'S APPLIED
PSYCHOACOUSTICS LAB





Prof Hyunkook Lee, Founder/Director of the APL

THE ONES COAXIAL MONITORS CREATE THE
PERFECT ENVIRONMENT FOR ACADEMIC STUDIES



The [Applied Psychoacoustics Lab \(APL\)](#) at the UK's [University of Huddersfield](#) is an experimental hub created to advance our knowledge of the mechanism of human auditory experience, and provides perceptually-motivated solutions to audio engineering problems. Opened in 2013, its critical listening room has been home to various projects in spatial audio, especially on the perception,

capture and rendering of height images in 3D audio.

“Recently we’ve been focusing on virtual acoustics for extended reality applications,” explains Prof Hyunkook Lee, Founder/Director of the APL. “We’ve worked on a project that developed a six degrees of freedom audio augmented reality processing engine, which led us to develop binaural renderers, such as Virtuoso, which we just released.

” THE ONES PROVIDE EXCELLENT TONAL CONSISTENCY WHEREVER YOU SIT.

“We’re also conducting lots of experiments using VR headsets and also display systems to look into the interaction between audio cues and visual cues,” he continues. “That’s highly relevant for creating immersive experiences. It’s not just audio that gives you an immersive audio experience –because we see things in real life. We’re investigating how we perceive the immersive experience, how we can enhance it while we’re watching films or listening to music, and what kind of perceptual parameters actually provide this kind of experience.”

For the last decade, 24 Genelec [8040](#) monitors combined with a pair of [7070](#) subs have been

used to reproduce audio in APL’s critical listening room. However, a recent upgrade has seen 15 of the 8040s replaced with [8341](#) coaxial monitors from Genelec’s ‘The Ones’ [Smart Active Monitoring](#) series.

“There were two reasons basically,” recalls Lee, discussing the decision for the upgrade. “[The Ones](#) provide excellent tonal consistency wherever you sit in the room, which is very important when you have a lot of people in this space. When we hosted a recent AES International Conference on Spatial and Immersive Audio, we had 21 people in this room. And wherever they sat, they had an excellent experience. The tonal balance was



” GLM MAKES A HUGE DIFFERENCE, ESPECIALLY WITH IMMERSIVE AUDIO.

very consistent across the room, which was very important for this kind of demonstration situation.

“The second reason was for our research,” he continues. “We needed coaxial monitors because when you do localisation tests, the acoustic centre position is always important. With the 8040s, you have to take the average between the tweeter and woofer. But now with The Ones series, we know exactly where the acoustic centre is.”

The new setup allows APL to create a Dolby Atmos 9.1.6 space, while the remaining 8040s ensure that this can be expanded to cover higher channel count formats such as NHK’s 22.2

standard. In the expanded version, nine of the 8040s are deployed in the floor, height and rear centre positions.

A further advantage that APL has found from upgrading is the simplicity of room switching made possible with [GLM software](#). “We can tune the whole room with the 9.1.6 system in less than five minutes and that was a big factor,” says Lee. “GLM makes a huge difference, especially with immersive audio. Of course, you get a very significant difference with stereo as well. But with a 9.1.6 system with so many monitors working together, the fact that we can actually tune the entire system to the room is a great advantage.”



The APL's original configuration, featuring twenty four 8040 monitors and two 7070 subwoofers.



The APL recently hosted an AES International Conference on Spatial and Immersive Audio

With the new system in place, APL is continuing its efforts to help improve our understanding of immersive audio environments. “Recently, we’ve been focusing on binaural audio for virtual monitoring and extended reality applications,” explains Lee. “And my current research focuses on what kind of roles audio plays in providing an immersive experience. And for that, it’s all about understanding what content producers really

think about immersive audio, and what kind of experience users expect from these immersive systems. We need to understand each other and try to narrow the gap and work together in a collaborative environment. Composers, producers, engineers, researchers and developers all need to get together to discuss what really makes spatial audio truly immersive.”

THE KIT

- 15 x 8341A
- 9 x 8040A
- 2 x 7070A
- 1 x GLM Software

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