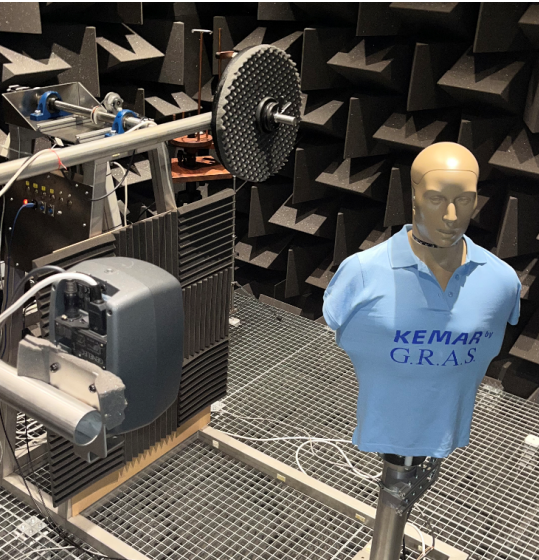


## CoE RAISE helps Treble Technologies improve acoustic response in virtual reality applications



Treble Technologies is an Icelandic startup and SME specializing in acoustic simulations. They simulate the acoustical effects of proposed architectural designs and present these results in virtual reality. This lets Treble's clients experience the soundscape of a building or other environment so that they can identify and correct acoustic problems before construction begins.

In order to provide the most accurate presentation to their clients, however, Treble needs to know more than just the building's acoustics. They also need to know how the sound that reaches a listener's eardrums is affected by which way the listener is facing.

[www.treble.tech](http://www.treble.tech)

### Solution

In order to collect training data for its AI modelling, CoE RAISE Task 4.4 (Sound Engineering) maintains a custom-built test apparatus in the Acoustic and Tactile Engineering (ACUTE) laboratory at the University of Iceland; this consists of a mannequin with interchangeable ear inserts and a loudspeaker located in an echo-free environment. The system is automated and measures the acoustic response from approximately 1000 different directions in order to obtain a complete picture of the acoustic effects.

In collaboration with researchers in CoE RAISE Task 4.4 and the Icelandic National Competence Center (NCC) for High-Performance Computing (IHPC), Treble used these experimental facilities to measure the acoustic response of a human analogue. This provided the data necessary for Treble to include directional effects in their virtual reality presentations, allowing their clients to make more informed decisions.

### Impact

Feedback arising from the collaboration between Treble and CoE RAISE has been invaluable to RAISE T4.4, as it identified several improvements to our processes that are currently being implemented. Treble's use of the data collected during this collaboration demonstrates both that the data being collected by RAISE T4.4 is useful in traditional acoustic applications and that a thorough understanding of these listener-directional effects can markedly improve the quality and accuracy of virtual reality applications. The research aim of RAISE Task 4.4 is to study these effects, and ultimately produce an AI model that will enable others, who don't have access to similar experimental facilities, to incorporate this information into their own applications.