SpeakerPhone

a high-density array of speakers for presence applications

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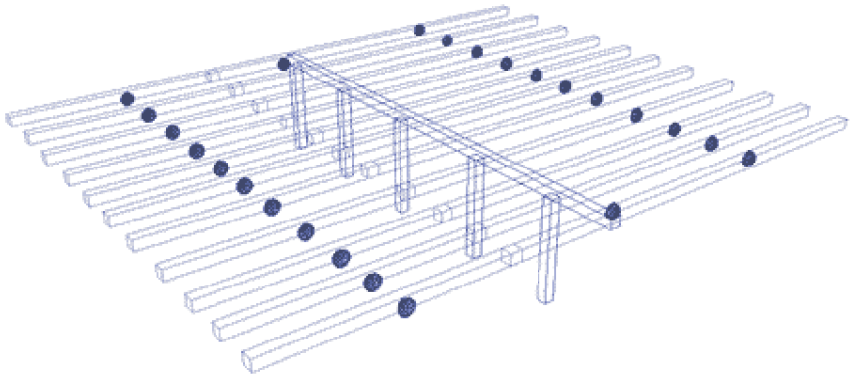
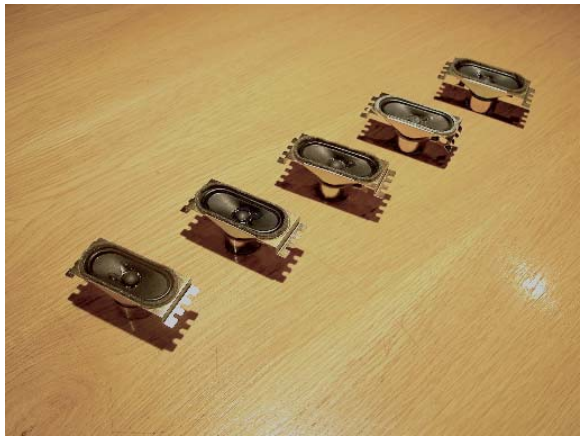
SpeakerPhone is an inexpensive, modular platform of individually addressable speakers that enables sound to be targeted instantly to a precise location and to travel along a path. The project enables a range of presence applications including the creation of highly customized physically-navigable soundscapes and the transmission and layering of sound information across multiple locations in space or time.

The current prototype consists of 24 miniature speakers arranged in a rounded rectangle and mounted on the ceiling in one room of our laboratory. Live audio or prerecorded sound samples originating from a computer or other source can be addressed to any of the speakers instantaneously, via a computer control interface. The SpeakerPhone architecture provides the ability to create customized effects, such as making a sound travel around the room in various directions and rates of speed, or having a sound follow someone moving through the room.



Unlike traditional audio spatialization techniques in which listeners must wear headphones or remain still in one location (such as a movie theater), SpeakerPhone enables the creation of a rich and multi-layered audio soundscape that is tightly integrated with the surrounding architecture and that listeners can navigate and explore by physically moving around. This soundscape can be devised for a particular effect, or it can be a reproduction of an audio environment captured with a similarly-arranged array of microphones. SpeakerPhone could also be used to "reveal" data traveling through wires and over networks as a way of increasing awareness of these concealed information pathways.



An earlier prototype featured speakers arranged in an even tighter array in which it was possible to create even more targeted effects. Future research directions include adding more independent computational capability within each speaker node, forming a self-organizing ad-hoc network protocol for controlling playback and movement of audio from node to node, and creating an analogous array of microphones for capture applications.

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