

## NETWORKED ROBOTS FOR REMOTE DYNAMIC ACOUSTIC EXPERIMENTS

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The performance of the Mechatronic Acoustic Research System (MARS) will be demonstrated. MARS provides remote access to a robot-enabled recording space where users can design complex audio experiments and collect data for use in research.

We will showcase a web-hosted design interface for MARS, which will display a live video feed of the recording space located in the Coordinated Science Laboratory at the University of Illinois Urbana-Champaign. Using this interface, attendees will be able to configure experiments with moving microphones and speakers, which will be rendered in a *digital twin* physics simulator and run live in our robot room. Recorded data will be made available for playback at the venue.

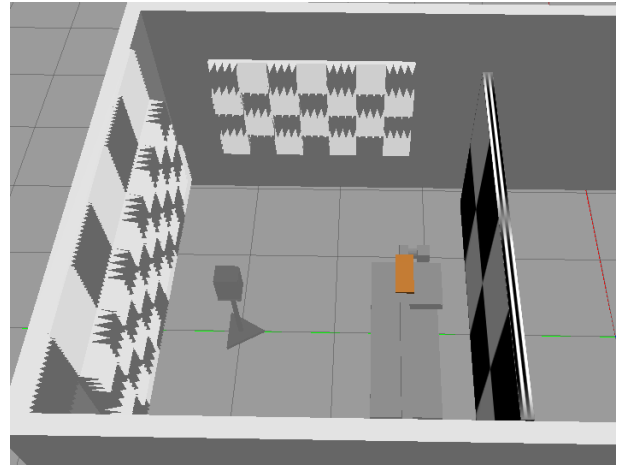
The demonstration will highlight several of the studio's robotic components, including our SpiderBot and acoustic head simulator. The SpiderBot, seen in Figure 1, is a cable-driven parallel robot with an instrument payload that can be precisely directed along a three-dimensional trajectory. The acoustic head simulator, seen in Figure 3, has two microphones in the ear canals and a loudspeaker at the mouth.

Loudspeakers will be used to play audio from various parts of the room.

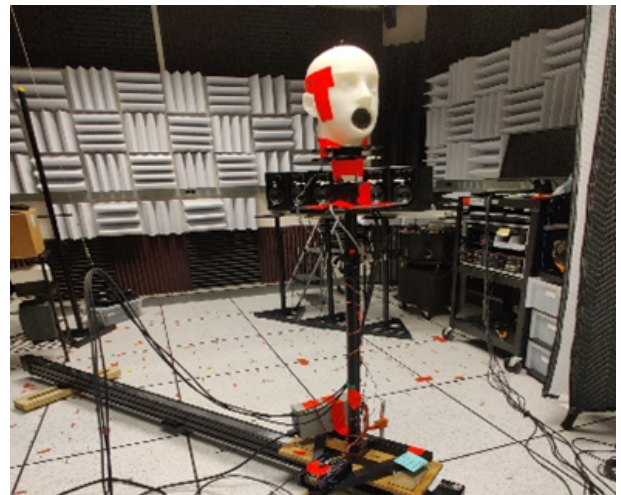
Attendees will use this MARS setup to record spatially interesting audio, highlighting the application of robotics and remote-access for audio data collection.



**Fig. 1.** SpiderBot system



**Fig. 2.** Digital twin of the MARS system



**Fig. 3.** Dummy head payload