**182nd Meeting of the Acoustical Society of America**

**Acoustic Sensors Pinpoint Shooters in Urban Setting #ASA182**

*Modeling and optimizing sensor networks for a specific environment will help missions narrow in on shooter locations*

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DENVER, May 23, 2022 – During a gunshot, two sound events occur: the muzzle blast and the supersonic shock wave. Acoustic sensors, such as single or arrays of microphones, can capture these sounds and use them to approximate the location of a shooter.

As part of the 182nd Meeting of the Acoustical Society of America at the Sheraton Denver Downtown Hotel, Luisa Still, of Sensor Data and Information Fusion, will discuss the important factors in determining shooter localization accuracy. Her presentation, "Prediction of shooter localization accuracy in an urban environment," will take place May 23 at 12:45 p.m. Eastern U.S.

In an urban setting, buildings or other obstacles can reflect, refract, and absorb sound waves. The combination of these effects can severely impact the accuracy of shooter localization. Preemptively predicting this accuracy is crucial for mission planning in urban environments, because it can inform the necessary number of sensors and their requirements and positions.

Still and her team used geometric considerations to model acoustic sensor measurements. This modeling, combined with information on sensor characteristics, the sensor-to-shooter geometry, and the urban environment, allowed them to calculate a prediction of localization accuracy.

"In our approach, the prediction can be interpreted as an ellipse-shaped area around the true shooter location," said Still. "The smaller the ellipse-shaped area, the higher the expected localization accuracy."

The group compared their accuracy prediction to experimental performance under various geometries, weapons, and sensor types. The localization accuracy depended significantly on the sensor-to-shooter geometry and the shooting direction with respect to the sensor network. The smaller the distance between the shooting line and a sensor, the more accurate they could be with their prediction of the source. Adding more sensors increased the accuracy but had diminishing returns after a certain point.

"Each urban environment is too individual (e.g., in terms of layout, building types, vegetation) to make a general recommendation for a sensor set up," said Still. "This is where our research comes in. We can use our approach to recommend the best possible setup with the highest accuracy for a given location or area."

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----------------------- MORE MEETING INFORMATION -----------------------

USEFUL LINKS

Main meeting website: <https://acousticalsociety.org/asa-meetings/>

Technical program: <https://eventpilotadmin.com/web/planner.php?id=ASASPRING22>

Press Room: <https://acoustics.org/world-wide-press-room/>

WORLDWIDE PRESS ROOM

In the coming weeks, ASA's Worldwide Press Room will be updated with additional tips on dozens of newsworthy stories and with lay language papers, which are 300 to 500 word summaries of presentations written by scientists for a general audience and accompanied by photos, audio and video. You can visit the site during the meeting at <http://acoustics.org/world-wide-press-room/>.

PRESS REGISTRATION

We will grant free registration to credentialed journalists and professional freelance journalists. If you are a reporter and would like to attend, contact AIP Media Services at media@aip.org. For urgent requests, staff at media@aip.org can also help with setting up interviews and obtaining images, sound clips, or background information.

ABOUT THE ACOUSTICAL SOCIETY OF AMERICA

The Acoustical Society of America (ASA) is the premier international scientific society in acoustics devoted to the science and technology of sound. Its 7,000 members worldwide represent a broad spectrum of the study of acoustics. ASA publications include The Journal of the Acoustical Society of America (the world's leading journal on acoustics), JASA Express Letters, Proceedings of Meetings on Acoustics, Acoustics Today magazine, books, and standards on acoustics. The society also holds two major scientific meetings each year. See <https://acousticalsociety.org/>.