

## The friendly honk: Acoustical remake of car horns alerts without jarring

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Sound permeates the human experience—we are exposed to sounds from birth to death, and the human auditory system can distinguish and classify about 400,000 different sounds, according to some estimates. It is noise that gets our attention. Sometimes traumatically so.

Consider the car horn. It is a widespread practical application of this noise-trauma-alert principle—and an increasing source of noise pollution worldwide as the global traffic population grows. It also is the subject of new noise pollution research to be presented during Acoustics '17 Boston, the third joint meeting of the Acoustical Society of America and the European Acoustics Association being held June 25-29, in Boston, Massachusetts.

The study, led by Myungjin Bae of Soongsil University in Seoul, Korea, and presented at the meeting by SangHwi Jee, introduces a new pedestrian-friendly car-horn <u>sound</u> identified through the Mean Option Score (MOS). The MOS is a simple ranking method commonly used to evaluate machine speech, sounds and noise. Test listeners used MOS to evaluate candidate horn sounds based on five different perceptual qualities such as stress and loudness. It ranks sounds on a scale from bad (1) to excellent (5).

"The sound of Klaxon heard outside the car of the driver is uncomfortable because it is too loud to the people around him," Bae said. "In our study we used the existing historic Klaxon sound source, but made some modification concerning its volume and rhythm with



duration time by adding a power controller. Our new Klaxon sound can immediately alert the pedestrians of the danger while also reducing the unpleasantness and stress of the sound," Bae explained.

The historic standard car horn sound is familiar: It's the trademarknamed Klaxon car horn developed in 1908—the classic "ah-oo-gah" sounding horn.

To test the perceptual effects of their new <u>horn</u> sounds, researchers exposed 100 volunteers to a menu of sounds in hopes of finding those that were less irritating to the ear of pedestrians.

"For almost 100 years, the car Klaxon sound was almost invisible and its design was simple, and it had the advantage of being able to make a loud noise at low power. But the level of loudness could not be easily controlled. In this study, when a driver presses a Klaxon, a loud sound of 110dB or more is not transmitted directly to a pedestrian," Bae said.

The intended result is a calmer more peaceful environment, he said—attributes that increase a driver's focus and rational response. The selected sound can be applied to any motor vehicle. Its advantage is that it reduces stress on drivers as well as pedestrians or bikers, thus improving the city soundscape.

"Everyone can live more comfortably without hearing any annoying <u>noise</u> from the streets," Bae said.

**More information:** Main meeting website: <u>acousticalsociety.org/content/acoustics-17-boston</u>

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