

Deep learning algorithm can hear alcohol in voice

January 6 2023



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La Trobe University researchers have developed an artificial intelligence (AI) algorithm that could work alongside expensive and potentially biased breath testing devices in pubs and clubs.

The [technology](#) can instantly determine whether a person has exceeded the legal alcohol limit purely on using a 12-second recording of their voice.

In a [paper](#) published in the journal *Alcohol*, the study led by Ph.D. student Abraham Albert Bonela and supervised by Professors Emmanuel Kuntsche and Associate Professor Zhen He, from the Center for Alcohol Policy Research and the Department of Computer Science and Information Technology at La Trobe University, respectively, describes the development of the Audio-based Deep Learning Algorithm to Identify Alcohol Inebriation (ADLAIA) that can determine an individual's intoxication status based on a 12-second recording of their speech.

According to Albert Bonela, acute alcohol intoxication impairs cognitive and psychomotor abilities leading to various public health hazards such as road traffic accidents and alcohol-related violence.

"Intoxicated individuals are usually identified by measuring their blood alcohol concentration (BAC) using breathalyzers that are expensive and labor-intensive," Albert Bonela said.

"A [test](#) that could simply rely on someone speaking into a microphone would be a game changer."

The [algorithm](#) was developed, and tested against, using a database dataset of 12,360 audio clips of inebriated and sober speakers. According to the researchers, ADLAIA was able to identify inebriated speakers—with BAC of 0.05% or higher—with an accuracy of almost 70%. The algorithm had a higher performance of almost 76%, in identifying intoxicated speakers with a BAC of higher than 0.12%.

The researchers suggest that one potential future application of

ADLAIA could be the integration into [mobile applications](#) and to be used in environments (such as bars and sports stadiums) to get instantaneous results about inebriation status of individuals.

"Being able to identify intoxicated individuals solely based on their speech would be a much cheaper alternative to current systems where breath-based alcohol testing in these places is expensive and often unreliable," Albert Bonela said.

"Upon further improvement in its overall performance, ADLAIA could be integrated into mobile applications and used as a preliminary tool for identifying alcohol- inebriated individuals."

More information: Abraham Albert Bonela et al, Audio-based Deep Learning Algorithm to Identify Alcohol Inebriation (ADLAIA), *Alcohol* (2022). [DOI: 10.1016/j.alcohol.2022.12.002](https://doi.org/10.1016/j.alcohol.2022.12.002)

Provided by La Trobe University

Citation: Deep learning algorithm can hear alcohol in voice (2023, January 6) retrieved 6 May 2024 from <https://medicalxpress.com/news/2023-01-deep-algorithm-alcohol-voice.html>

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