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The Journal of the Acoustical Society of America

Volume 155, Issue 3_Supplement
March 2024

MARCH 01 2024

Toward audio-based sensing for pedestrian detection

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J. Acoust. Soc. Am. 155, A282 (2024)
https://doi.org/10.1121/10.0027509

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The detection and counting of pedestrians plays a central role for the design of smart cities. Although the use of cameras for this task has been shown to have high accuracy, they come at a high cost and are susceptible to challenges such as poor lighting, fog, and obstructed views. Our study investigates audio-based pedestrian detection, combining potentially low cost sensors with advanced machine learning based audio analysis algorithms. With an audio sensor installed along the walkway, machine learning algorithms can tell from the audio whether there is a pedestrian or not, or how far the pedestrian is from the sensor. Results show the general feasibility of audio-based pedestrian detection but fall short of reaching the accuracy levels of video-based detection.

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Online ISSN 1520-8524 Print ISSN 0001-4966

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