

## **A Real-Time Snore Detector Using Neural Networks and Selected Sound Features**

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**Abstract :** Obstructive Sleep Apnea Hypopnea Syndrome (OSAHS) is a widespread chronic disease that mostly remains undetected, mainly due to the fact that it is diagnosed via polysomnography which is a time and resource-intensive procedure. Screening the disease's symptoms at home could be used as an alternative approach in order to alert individuals that potentially suffer from OSAHS without compromising their everyday routine. Since snoring is usually linked to OSAHS, developing a snore detector is appealing as an enabling technology for screening OSAHS at home using ubiquitous equipment like commodity microphones (included in, e.g., smartphones). In this context, this study developed a snore detection tool and herein present the approach and selection of specific sound features that discriminate snoring vs. environmental sounds, as well as the performance of the proposed tool. Furthermore, a Real-Time Snore Detector (RTSD) is built upon the snore detection tool and employed in whole-night sleep sound recordings resulting to a large dataset of snoring sound excerpts that are made freely available to the public. The RTSD may be used either as a stand-alone tool that offers insight to an individual's sleep quality or as an independent component of OSAHS screening applications in future developments.

**Keywords :** obstructive sleep apnea hypopnea syndrome, apnea screening, snoring detection, machine learning, neural networks

**Conference Title :** ICBI 2021 : International Conference on Biosignals and Imaging

**Conference Location :** Barcelona, Spain

**Conference Dates :** October 25-26, 2021