

## **Artificial intelligence techniques used in respiratory sound analysis – a systematic review**

### **Abstract**

Artificial intelligence (AI) has recently been established as an alternative method to many conventional methods. The implementation of AI techniques for respiratory sound analysis can assist medical professionals in the diagnosis of lung pathologies. This article highlights the importance of AI techniques in the implementation of computer-based respiratory sound analysis. Articles on computer-based respiratory sound analysis using AI techniques were identified by searches conducted on various electronic resources, such as the IEEE, Springer, Elsevier, PubMed, and ACM digital library databases. Brief descriptions of the types of respiratory sounds and their respective characteristics are provided. We then analyzed each of the previous studies to determine the specific respiratory sounds/pathology analyzed, the number of subjects, the signal processing method used, the AI techniques used, and the performance of the AI technique used in the analysis of respiratory sounds. A detailed description of each of these studies is provided. In conclusion, this article provides recommendations for further advancements in respiratory sound analysis.

**Keywords** — Artificial intelligence, lung disease, respiratory sounds, statistical computing, systematic review