Study of feature selection algorithms to improve arrhythmia detection performance on ECG signal

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pre-screening tool to aid in arrhythmia detection. These systems are complemented by clinical symptoms and diagnostic measurements to determine the patient's arrhythmia status [3].

In this context, this study aims to improve the accuracy of arrhythmia detection by focusing on feature selection. The selection technique plays a vital role in identifying relevant risk factors associated with the classified disease. By eliminating unnecessary attributes, medical diagnoses can be achieved faster and with improved accuracy.

However, previous studies have identified several gaps and limitations in existing methods. These include inadequate exploration of noise removal techniques, overemphasis on specific features, lack of comparative analysis, challenges in obtaining testable data, the need for further validation, inadequate handling of noise and baseline drift, absence of comprehensive comparative analysis, suboptimal handling of imbalanced data, ineffective impact reduction techniques, and increased processing costs [4] [5] [6].

Addressing these gaps through ongoing research and innovative approaches is crucial to advance the field of arrhythmia detection. By providing more context, discussing the importance of accurate arrhythmia detection, and highlighting the limitations of existing methods, this study aims to contribute to the development of more accurate and reliable techniques for detecting arrhythmias.

I. Introduction

Cardiovascular disease (CVD) is the leading cause of global mortality, resulting in approximately 17.9 million deaths annually [1]. The majority of these deaths are attributed to heart attacks and strokes, and a significant proportion occurs prematurely in individuals under the age of 70.

The early and accurate detection of arrhythmias holds crucial importance in reducing cardiovascular mortality. Atrial and ventricular arrhythmias can significantly disrupt cardiac rhythm and lead to cardiac dysfunction, posing substantial risks to patients [2]. Computer-assisted classification systems that analyze electrocardiogram (ECG) recordings serve as a