MEMOIRE

En vue de l'obtention du diplôme de **Master**

Filière : **Informatique**

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Thème

Decision Support Systems for

Cardio Vascular Disease

using Deep Learning Techniques

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Abstract

In the late 20th century, the urgent need to process the exponentially rising collected data about cardiovascular diseases led the researchers to explore the potential results of decision support systems (DSS). Provided that the ECG signal plays the important role in the clinical diagnosis of heart diseases, various methods undertook this time series data analysis as a step forward toward implementing their interpretation models.

This thesis presents the principal parts of ECG analyses and the innovative state-of-the-art classification methods of the aforementioned data. In the interest of classifying the most common type of CVDs "arrhythmias". Preceded by general concepts and important information to prepare the reader to comprehend the following methodologies and paradigms used.

In the literature, Most methods started by acquiring ECG data from the publicly available datasets, mainly MIT-BIH arrhythmia database. Following this phase, a preprocessing of the signal along with feature extraction, selection, and/or transformation. Finally, the classification and evaluation process, yielding success measures of the adopted method.

Many researchers took two main approaches to classify: 1) individual heartbeats, 2) longer-term ECG signals. Likewise, using the same or different patient data for training and test sets as validation method. As a result, they used many mechanisms producing excellent results, although some prone to error and/or biased.

This topic of research still needs attention in some areas where ambiguity falls upon. Moreover to some clinical implication for evaluating the DSS.