

# **Dissertação de Mestrado em Engenharia Informática (2019/2020)**

**Title:** ECG based Prediction Model for Cardiac-Related Diseases using Machine Learning Techniques

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## **Summary**

Cardiac or heart-related diseases are the leading cause of a considerable number of deaths across the globe over a few decades. Cardiac disease prediction is considered as the most complicated task in the field of medical science. Therefore, there is a need for an accurate, reliable and feasible approach to predict such diseases in time for proper treatment. Hence, machine learning (ML) algorithms have been applied to numerous medical datasets to analyze health data. In recent times, several scholars are using classification/clustering techniques for detecting/predicting cardiac-related diseases. This proposal aims to develop Electrocardiogram (ECG) signals based prediction model for cardiac-related diseases. The main objective of this research is to develop an ECG based model which can initially discover and extract hidden knowledge such as patterns and relationships associated with heart diseases. Further, train extracted features from ECG signals, which can be useful in diagnosing heart diseases and thus assist healthcare professionals in making intelligent clinical decisions. By providing effective treatments on time, the proposed model may not only help to reduce treatment costs, but it may also assist in getting rid of the life-threatening diseases on time.

## **Tasks**

- T1 – Technological background study;
- T2 – Review the State-of-the-art;
- T3 – Requirements Analysis;
- T4 – Design and construction, including integration;
- T5 – Testing and evaluation;
- T6 – The writing of the dissertation.

## **Expected Result**

In this research work the following deliverables are expected:

- A validated computational tool;
- A publication describing the method and the validation results.

## **Timeline**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
T1	X	X	X						
T2		X	X	X					
T3			X	X					
T4				X	X	X			
T5						X	X	X	
T6					X	X	X	X	X

## References:

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3. Pinho, A., Pombo, N., Silva, B.M., Bousson, K. and Garcia, N. Towards an accurate sleep apnea detection based on ECG signal: The quintessential of a wise feature selection. *Applied Soft Computing*, p.105568, 2019.
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