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# Dedication

To the whole family

To all my friends

# Abstract

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# Introduction

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# Chapter 1: State of the art

## Class decomposition

Class decomposition describes the process of segmenting each class into a number of homogeneous sub-classes. This can be naturally achieved through clustering. Utilising class decomposition can provide a number of benefits to supervised learning, especially ensembles. It can be a computationally efficient way to provide a linearly separable dataset without the need for feature engineering required by techniques like Support Ve]ctor Machines (SVM) and Deep Learning. For ensembles, the decomposition is a natural way to increase diversity; a key factor for the success of ensemble classifiers. In this paper, we propose to adopt class decomposition to the state-of-the-art ensemble learning Random Forests. Medical data for patient diagnosis may greatly benefit from this technique, as the same disease can have a diverse of symptoms. We have experimentally validated our proposed method on a number of datasets in that are mainly related to the medical domain.

# Chapter 2: Conception

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# Chapter 3: Experimentation and Results

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# Conclusion and Perspectives

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