

APPLICATION OF MACHINE LEARNING IN COMPUTING: CASE STUDIES AND CHALLENGES

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Abstract

The application of machine learning in computing has become one of the most significant developments in modern technology. This study examines a range of use cases from various sectors, including healthcare, finance and transport, which demonstrate how machine learning can improve the efficiency, accuracy and capabilities of computer systems. Through case study analysis, it is shown that machine learning is capable of automating complex tasks and providing deep insights. However, the implementation of this technology also faces a number of challenges, such as the need for high-quality data, model interpretability issues, and high computational costs. Furthermore, there are ethical and legal issues to be considered, especially in relation to privacy and potential bias in the models. This research highlights the importance of a careful approach and appropriate strategies to overcome these barriers, in order to fully utilise the potential of machine learning while minimising the risks involved.

Keywords: Application of Machine Learning, Field of Computing.

Introduction

The digital revolution that has taken place in the last few decades has brought significant changes in various fields, including the field of computing. Computing is the process of using information technology to effectively perform, manage, and process data to solve various types of problems. It includes all forms of calculations and data manipulation carried out with the help of computer hardware and software. (Lin & Prasanna, 2023).. In addition, computing involves various disciplines and techniques, including mathematics, algorithms, and programming models to process information and obtain desired results. Computing has become an important foundation in fields such as science, engineering, economics, and creative industries, enabling the analysis of complex data and the automation of tasks that previously required human intervention. (Aljulayfi & Djemame, 2021)..

One of the most prominent developments in this digital era is the rise of machine learning (ML), a branch of artificial intelligence (AI) that allows computers to learn from data and make decisions or predictions without being explicitly programmed.

Machine learning has been applied in various aspects of computing, from process optimisation, big data analysis, pattern recognition, to the development of autonomous