UNIVERSITI TEKNOLOGI MARA
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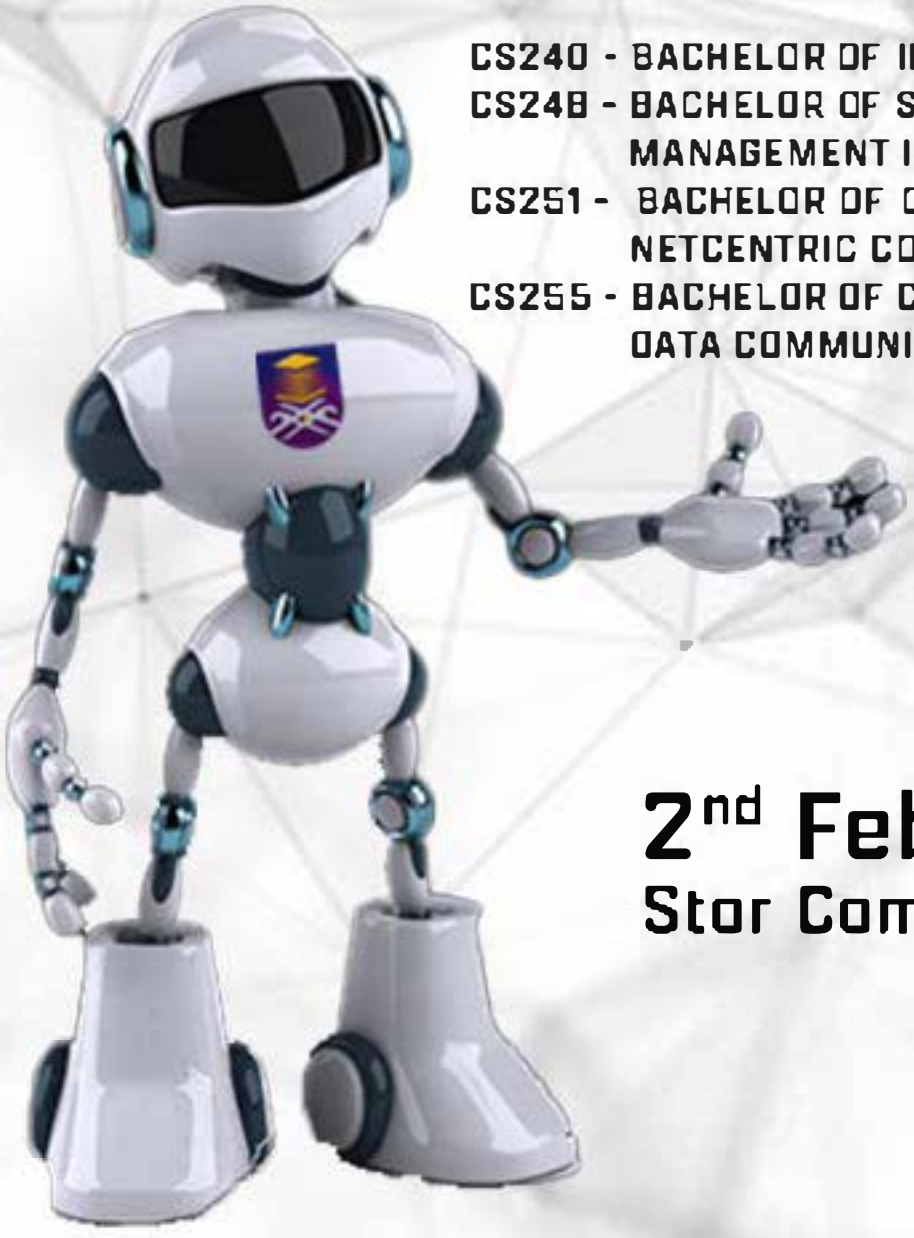
RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES

REMACS 5.0



CS240 - BACHELOR OF INFORMATION TECHNOLOGY (HONS.)
CS248 - BACHELOR OF SCIENCES (HONS.)
MANAGEMENT IN MATHEMATICS
CS251 - BACHELOR OF COMPUTER SCIENCE (HONS)
NETCENTRIC COMPUTING
CS255 - BACHELOR OF COMPUTER SCIENCE (HONS)
DATA COMMUNICATION & NETWORKING

2nd Februory 2023

Stor Complex, UiTM Perlis

Organized by:
College of Computing, Informatics and Media
Universiti Teknologi MARA Perlis Branch

Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)

Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)

Editors
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Preface

It is with great pleasure that we present this extended abstract book, titled "The 5th Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)". This book is a collection of research work in the fields of Computer Science and Mathematics, contributed by the final year students from Universiti Teknologi MARA, Perlis Branch. The aim of this book is to showcase the diversity and depth of research in these two interrelated fields.

Mathematics and Computer Science are two fields that have seen tremendous growth and advancement in recent years. With the rise of new technologies and the increasing demand for data-driven solutions, researchers in these fields have been working hard to develop new theories, algorithms, and models that can help solve some of the most pressing problems of our time. This book is a testament to their hard work and dedication.

The abstracts in this book cover a wide range of topics, including algebra, analysis, logic, computer architecture, algorithms, artificial intelligence, machine learning, computer network, netcentric computing and many more. The work presented here is both theoretical and practical, and has the potential to impact many areas of society, from finance and healthcare to education and security.

We hope that this book will serve as a valuable resource for future students in the fields of Mathematics and Computer Science. We also hope that it will inspire more students to pursue innovative and groundbreaking research in these two fields. Finally, we would like to express our gratitude to all the contributors for their hard work and dedication, without which this book would not have been possible.

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REMACS 5.0

EVENT SCHEDULE

8:00 – 8:30 am
•Registration

8:00 am – 12:00 pm
•FYP Project Presentation

12:00 - 2:00pm
•Lunch Break

2:15 – 2:35 pm
•National & Wawasan Setia Anthems
•Doa Recitation

2:35 – 2:45 pm
•Welcoming Address by Director of REMACS 5.0

2:45 – 2:55 pm
•Officiating & Closing Remarks from Rector of UiTM Perlis

2:55 – 3:00 pm
•REMACS 5.0 Montage

3:00 – 4:00 pm
•Awarding of Winners:
•Best Poster
•Best Project Award

•Photo Session

•End of Ceremony

Dress Code: Formal / Corporate

List of Papers

RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES

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EXTENDED ABSTRACTS

DIABETES PREDICTION USING MACHINE LEARNING

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College of Computing, Informatics and Media, Universiti Teknologi MARA Perlis Branch, Malaysia

Abstract

The increasing population has led to longer wait times for patients in the medical industry, particularly for diabetes check-ups. Machine learning technology can assist with speeding up the process of identifying diabetes by utilizing algorithms and techniques to train on previous data and predict potential problems. Two types of machine learning, supervised and unsupervised, are used to assist patients and the medical sector. The data and results from these methods can be used as references for diagnosis. Based on the diagnostic measurement data gathered for this study, it is found that using prediction model can assist patients and the medical sector in predicting diabetes The effectiveness of these methods will be determined by evaluating their accuracy using various metrics after testing and training. An algorithm or method with a high percentage of accuracy will be considered effective when compared to others. In summary, machine learning technology can help improve the efficiency of identifying diabetes by analyzing previous data and making predictions, which can ultimately benefit both patients and the medical industry.

Keywords*: diabetes, machine learning, prediction model*

1. Introduction

The objective of this project is to gather available data of diabetes from a diabetes institute. This will involve collecting a large dataset of diabetes-related information such as patient demographics, medical history, lab results, and other relevant data. Once the dataset has been collected, machine learning algorithms will be used to analyze the data and develop a prediction model that can accurately identify whether or not a patient has diabetes. The effectiveness of the prediction models developed in this project will be thoroughly evaluated and compared using a variety of evaluation metrics will be the final goal for this project. These metrics will provide a quantitative measure of the model's performance.

2. Methodology

This project will begin by analyzing the problem statement to gain a better understanding of the goals and objectives. Relevant topics will be identified by researching various sources. The next step will be to prepare the data by determining the amount of data needed and the attributes of the data. Multiple sources such as Kaggle will be searched for data that is relevant to the study, and the data will be downloaded in CSV format for viewing in Microsoft Excel. After that, the data will be reviewed and understood to develop a clear vision for the techniques and methods that will be used for the project. The data will then be transferred to Jupyter Notebook for pre-processing and cleaning, utilizing Python programming and libraries such as scikit-learn, NumPy and Pandas. Outliers will be detected and removed from the dataset, and feature selection will be performed using Pearson's Correlation Coefficient technique. The data will be split into 80/20 for testing and training, and machine learning algorithms such as Naive Bayes, Support Vector Machine and Decision Tree will be used to train the prediction model. The model's performance will be evaluated using metrics such as confusion matrix, accuracy, recall, precision, and f-1 score.

3. Results and Discussion

The result from the evaluation metrics found that the Support Vector Machine algorithm had the highest accuracy score of 82%, compared to 77% for Naive Bayes and 79% for Decision Tree from the accuracy testing. This suggests that the prediction model is effective at providing accurate predictions. However, it is important to consider the quality and availability of the data, as well as the complexity and noise level, when evaluating the performance of the model. These factors can have an impact on the accuracy of the predictions and must be examined carefully.

4. Novelty of Research / Product

There have been a number of research that have investigated the development of machine learning in medical sectors. By making computers capable of self-learning without human intervention, machine learning aims to enable computers to modify their behaviour accordingly (Ławrynowicz & Tresp, 2014). Making programmes that can learn data and predict the output by itself requires machine learning (Kaličanin et al., 2019). The healthcare industry relies heavily on predictive modelling (Axelrod & Vogel, 2003). The term "predictive analytics" refers to a number of methods that are used to draw conclusions about the possibility of specific future occurrences (Brooks & Thompson, 2017).

5. Conclusion

In conclusion, machine learning techniques can be effectively used for the prediction of diabetes. The process of building a predictive model for diabetes typically involves several steps such as data pre-processing, feature selection, model selection, and model evaluation. By using suitable machine learning algorithms, it is possible to develop a model that can accurately predict whether a patient has diabetes or not.

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