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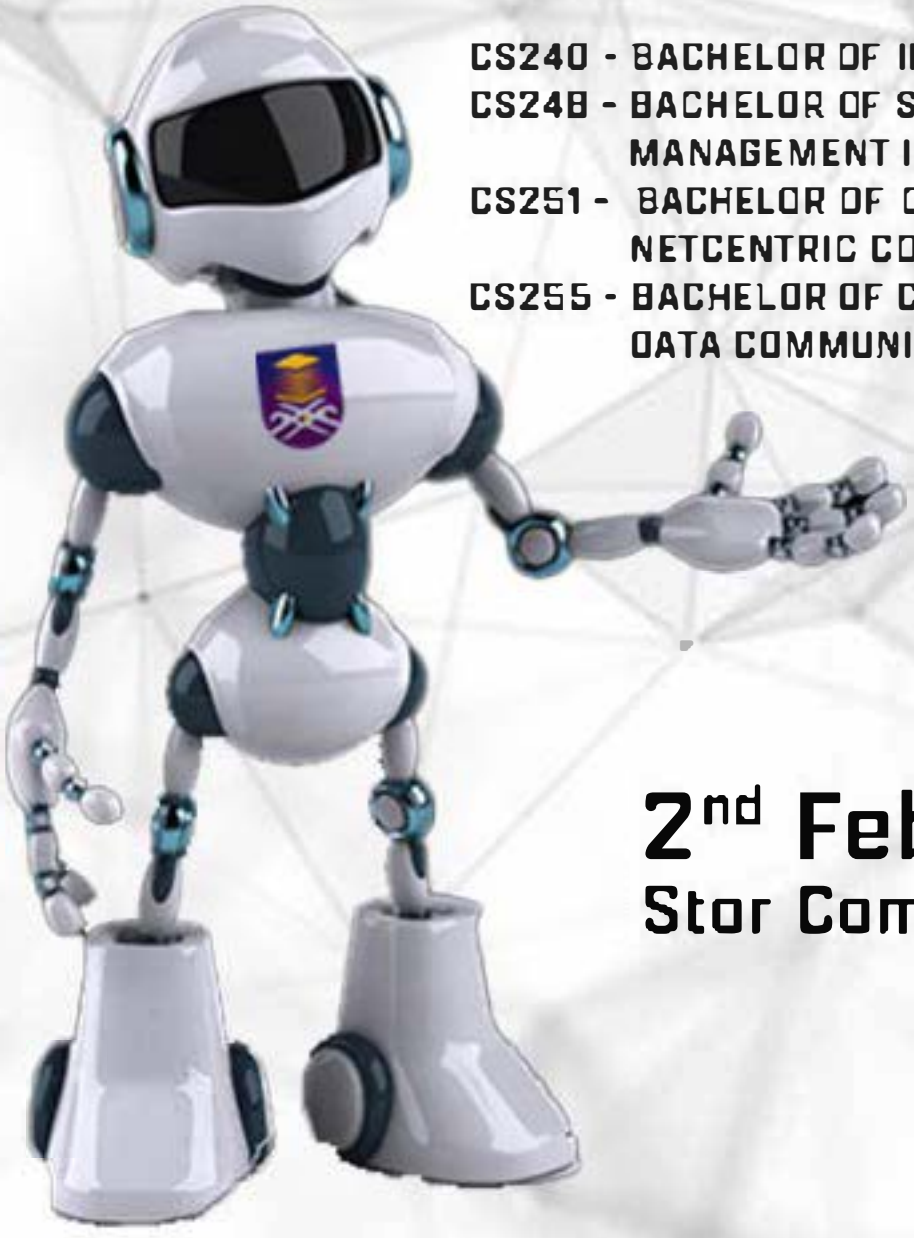
RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES

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
Rafiza Ruslan, Mohamad Najib Mohamad Fadzil, Noorfaizalfaird Mohd Nor, Mohammad Hafiz bin Ismail

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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

PREDICTION OF BREAST CANCER DISEASE USING MACHINE LEARNING APPROACH

Wan Nashua Amira and Nor Hayati Shafii
College of Computing, Informatics and Media, Universiti Teknologi MARA Perlis Branch, Malaysia

Abstract

The most prevalent invasive cancer in women, and the second leading cause of cancer mortality in women is breast cancer. Researchers' interest in breast cancer research and prevention has increased recently. However, the advent of data mining techniques has made it possible to efficiently extract more valuable information from large databases, and the information so retrieved may be used for prediction, classification, and clustering. Three different classification models, including Decision Tree (DT), Random Forest (RF), and Logistics Regression (LR), are used for the classification of datasets related to breast cancer in this study to develop an accurate model to predict breast cancer disease and reduce the risk of breast cancer death. Wisconsin Breast Cancer Database (WBCD). Three metrics are utilised to assess how well these three classification models performed: Precision, Recall, and F1 Score. Prediction accuracy numbers are also included. An examination of comparative experiments demonstrates that the random forest model can outperform the other two techniques in terms of performance and accuracy. As a result, it has been determined that the study's model has clinical and referential value in real-world applications.

Keywords: Breast cancer, predict, early prevention, Machine learning, Random Forest, Decision Tree, Logistic Regression, accuracy

1. Introduction

Breast cancer is the most frequent type of cancer overall, regardless of age, gender, or lifestyle, particularly in the USA. In order to create an appropriate model for breast cancer disease prediction, the study employs a dataset of US patients with breast cancer. There are 699 instances and 11 variables in the dataset. The paper analyses the best model that has the highest accuracy and predicts the outcome of breast cancer disease using machine learning technique to avoid final stage cancer and assist to early preventive of disease. This paper uses Phyton and Machine Learning Approach to forecast illness diagnosis.

2. Methodology

The data were gathered via the UCI Machine Learning Repository, a secondary data source where patients from the USA donate their data for mathematical research. In a classification model, the dataset has two values for benign and malignant conditions. The independent and dependent variables in the data must be identified prior to the modelling procedure. The dataset also has to be profiled, meaning that all null values must be removed, along with any outliers in the data. Since data visualisation is a crucial ability in machine learning, the data will be summarised into a chart or graph before the models are developed. It oversees giving the provided data a qualitative interpretation. Three classification methods—Decision Tree, Random Forest, and Logistic Regression—will be used to model the data. The most effective strategy to forecast the outcome will be the one with the highest accuracy among the three.

3. Results and Discussion

Three mathematical measurements—Accuracy, Confusion Matrix, Precision, Recall, and F1 Score—will be used to evaluate the models' output from the three-classification technique in the study. The metrics will be used to determine which model has the best accuracy and to compute and assess the results.

4. Novelty of Research

Madhuri and Bharat et al. introduce a comparative study using supervised machine learning techniques to identify breast cancer patients. They used a variety of machine learning algorithms, such as logistic regression, rainforest, decision tree, and multi-layer perceptron. When compared to other algorithms, multi-layer perceptron's perform well (Gupta & Gupta, 2018). Takada developed a novel computational technique for predicting the pathological complete response to neoadjuvant chemotherapy in patients with primary breast cancer using alternating decision trees (Takada et al., 2012). Furthermore, when compared to other data classification techniques, ML algorithms produce more accurate results in constant disease prediction. Many studies have already demonstrated that supervised based classification techniques achieve excellent accuracies in the field of disease prediction (Javed & Shamrat, 2020). This research will advance the understanding of how to use machine learning to develop an accurate model that can predict the development of breast cancer. This research is an extension of earlier studies that may aid cancer patients in the early detection and initiation of treatment. As a result, it is possible to decrease the number of deaths from breast cancer, lower the cost of therapy, and improve the quality of life for patients.

5. Conclusion

Experimental results showed that the highest accuracy score is pointed to Random Forest, conforming that it is the best forecast model. The value of accuracy score obtained by Random Forest model is 97.81% higher than Decision Tree which is 96.35% and Logistic Regression with 97.08% indicating the forecasted values are closest to the actual values.

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