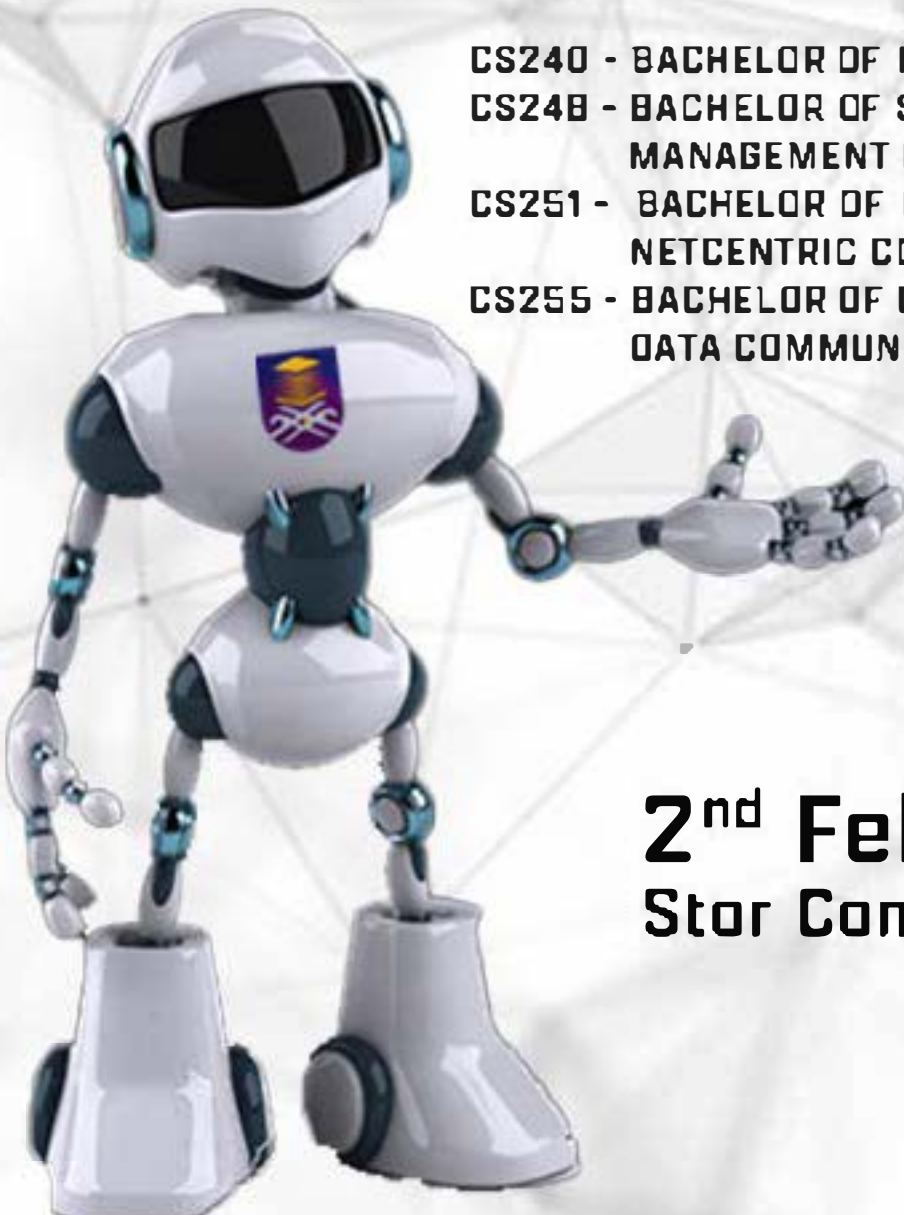


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**RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES**

# **REMACS 5.0**

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- CS240 - BACHELOR OF INFORMATION TECHNOLOGY [HONS.]**
  - CS248 - BACHELOR OF SCIENCES [HONS.]  
MANAGEMENT IN MATHEMATICS**
  - CS251 - BACHELOR OF COMPUTER SCIENCE [HONS]  
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DATA COMMUNICATION & NETWORKING**

**2<sup>nd</sup> February 2023**  
**Stor Complex, UiTM Perlis**

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**Organized by:**  
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**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)

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# Preface

It is with great pleasure that we present this extended abstract book, titled "The 5<sup>th</sup> 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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# 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*

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# EXTENDED ABSTRACTS

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RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES  
**REMACS 5.0**

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# **WHEELS4RENT: A WEB-BASED VEHICLE RENTAL AND MANAGEMENT SYSTEM WITH SHORT MESSAGE SERVICE (SMS) NOTIFICATION**

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## **Abstract**

Wheels4Rent is a web-based vehicle rental and management system integrated with Short Message Service (SMS) notification technology to better manage the operations of a vehicle rental business. This system's evolution has also made it possible for users to browse and book from a wide range of vehicles available online without needing to physically visit any of the rental places. This system incorporates SMS notification technology that helps to notify users about the status of their rental bookings. This system also enables the admin to keep track of the rental records in time and manage all the rental requests systematically. The target users for this system are the local community. The researcher has developed this system based on System Development Life Cycle (SDLC) by using the Waterfall Model as the methodology. The system is developed with PHP and MySQL by using Notepad++ and phpMyAdmin serving as the respective code editors and database management tools. The User Acceptance Testing (UAT) was conducted to evaluate user's acceptance of the developed system.

*Keywords: bookings, rental, SMS notification technology, vehicles*

## **1. Introduction**

Most vehicle rental companies use a manual approach that seems complicated and time-consuming for customers and businesses. Customers must personally call or visit the company to make a reservation. Finding a company's phone number or physical address can be a hassle for customers, who may end up spending extra money and effort. As an outcome, this study proposed developing the Wheels4Rent system that allow users to book and rent vehicles online and allow staff to keep track of rental records in a timely manner and manage all rental requests without issues. The system's primary objective is to facilitate users to reserve and rent vehicles online, as well as make it easier for businesses to efficiently manage rental operations that involve both users and administrators. The system will make use of SMS notification technology to keep users notified about the status of their rental bookings. As a result, users no longer need to bother coming to the rental place to perform rental operations from start to the end, saving them both time and effort as the system allows everyone to be able to access it anytime and anywhere in just a few clicks.

## **2. Methodology**

For the project development, the researcher has developed this system based on System Development Life Cycle (SDLC) by using the Waterfall Model as the methodology. The methodology involved the System Planning, Analysis, Designing, Implementation, Testing, as well as Maintenance and Documentation phase. The system planning phase is the first in the process and it called for preliminary research, the identification of the project's problem, objectives, scope, and significance, as well as conducting a literature review based on journals and related works. This phase is followed by the system analysis phase which is to identify the hardware and software requirements for the development and estimate the project schedule from start to finish. Next, the system design phase is carried out which is defined by designing the use case diagram and Entity Relationship Diagram (ERD) that used in database design to create an overview of data structures. The system implementation phase is then conducted, which involved in writing the program code and developing system interfaces using Notepad++ and data storage in MySQL using phpMyAdmin. In the testing phase, User Acceptance Testing (UAT) was

conducted to evaluate the acceptance of 30 participants in the usability of the developed system. In the final phase, which is Maintenance and Documentation, the bugs are detected, errors in the system are fixed, and some modifications are implemented. All the information gathered, findings and analysis result, is also documented in this phase.

### **3. Results and Discussion**

The responses of 30 participants were evaluated using a User Acceptance Testing (UAT) in which the participants were provided with a set of questionnaires that prompted them to determine a scale of 1-5 for 18 questions including the background of respondent and user feedback of using the Wheels4Rent system. The testing is performed at the topmost layer which is the user interface of an application or system to evaluate the quality attributes of the application or system (Watanabe et al., 2017). The result and analysis are determined based on five different categories which are User Interface Satisfaction, Perceived Usefulness and Ease of Use, Attitude, Usability of the System and SMS Notification Function. After analysing all of the responses, researchers concluded that the Wheels4Rent system was manageable, usable, and successful in its intended purpose as most of the participants were satisfied with the interfaces, functionality and the effectiveness of SMS notification since the overall total mean of the questions in those five categories were above 4.

### **4. Novelty of Research / Product**

Wheels4Rent system has advanced to allow users to browse and book from a wide range of vehicles available online without needing to physically visit any of the rental places. For users' convenience, the system also incorporates SMS notification technology to keep them notified and updated on the status of their rental bookings so they will no longer be required to visit the rental place or must contact the company personally. This will eliminate the need for them to constantly waste time and energy going to the rental place from start to the end of the rental process. Once vehicle booking has been made, user can view their booking details in the system, which includes booking number, booking date, booking status, and invoice for user's reference. Through the Wheels4Rent system, it also enables admin to keep track of the rental records in time and manage all the rental request systematically. Admin has the ability to add, edit, view, update and delete the data pertaining to both vehicles and bookings. The booking request is subject to admin's approval before being notified to the user via SMS whether it has been approved or rejected.

### **5. Conclusion**

In conclusion, the system has succeeded in accomplishing all of its objective which are to develop a web-based application that facilitate user to reserve and rent vehicles online, as well as helps the business to manage rental operations effectively, to integrate the web-based application with Short Message Service (SMS) notification technology, and to evaluate the usability of the developed system using User Acceptance Test (UAT). Moreover, majority of the research participants found the Wheels4Rent system is helpful, thus it is safe to say that this system will make it easier for those in need of transportation in their quest to rent a vehicle. As a result, with this system in place, users may select from a wide range of vehicles to rent without having to physically visit the rental company.

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