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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]  
NETCENTRIC COMPUTING  
CS255 - BACHELOR OF COMPUTER SCIENCE [HONS]  
DATA COMMUNICATION & NETWORKING

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

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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)

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#### *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 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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# STUDENT ATTENDANCE SYSTEM USING FACIAL RECOGNITION BASED ON DEEP LEARNING

**Syahila Aina Haris and Zulfikri Paidi**

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

## **Abstract**

The learning process depends on student attendance. There are many ways to track student attendance, and one of them is using their signatures. The procedure has a number of drawbacks, such as taking a long time to complete attendance, attendance papers are lost, the administration must manually enter each student's attendance information into the computer and there is also a possibility of attendance fraud among students. In order to overcome this problem, this paper suggested a web-based face recognition student attendance system as a solution to this problem. In this suggested system, K-NN is used to categorize student faces, deep metric learning is used to build facial embedding, and Convolutional Neural Network (CNN) is used to detect faces in photos. The development of this system is also assisted by several other software. As a result, the computer can identify faces. This algorithm can identify the faces of students who appear in class, and their attendance will be recorded automatically into the system. As a consequence, tracking attendance information is made easier for student administration.

*Keywords: attendance system, face recognition, K-NN, CNN*

## **1. Introduction**

As mentioned earlier, the traditional method of recording students' attendance is quite slow and rapidly experiences problems. Therefore, this web-based system is targeted for students in universities, who need to record their attendance every time they attend classes. The system is developed to collect images of students along with their data that will be entered into the database such as their username and ID. The objective of this project is to develop a web-based student attendance system that uses a face recognition method and to evaluate the performance speed of the system network in sending data into the database after a student's face is captured using facial recognition technology.

## **2. Methodology**

The model of the System Development Life Cycle (SDLC) which consists of seven phases in total, and begins with initiation phase, planning phase, system requirement analysis phase, design and development phase, testing phase and finally documentation phase is the approach that is utilized in this project to define the project's process flow. At the planning phase, research from articles and journals papers by using UiTM Online Library and Google Scholar were done. In the system requirement analysis phase, all necessary data and information are collected including the hardware and software required. Development phases were done by capturing the students images by using the Acer Aspire 5 web camera. After the students' images are collected, it then will be stored in the database, along with the students' data.

## **3. Results and Discussion**

In order to investigate the usability of the system, an usability testing was done during the testing phase followed by a Google Form questionnaire that needed to be answered by respondents. The usability testing was involving 30 respondents among students and working people. Based on the results, it is found that mostly respondents agree that the system saves more time than the manual paper-based methods. Secondly, it is also found that most respondents opinionated that this new system is such an

easy system to learn. This is crucial in making sure no one is left behind in using this system. All in one, mostly respondents are satisfied with this new technology.

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

The clever method of the attendance management system uses face recognition to track attendance. Face recognition allows for passive identification, which means that the individual who has to be identified doesn't have to do anything to prove who they are. Face recognition is a two-steps process that starts with the identification of faces and moves on to matching those faces with those in the database. Numerous face detection and recognition techniques have been developed. Face recognition utilizes geometric features such the eyes, nose, eye brows, and cheeks as well as the appearance-based method, which encompasses the features of the entire face (Bhatti et al., 2018). Since any extra activity is not necessary for authentication when using facial images that can be acquired from a distance, the face recognition method is used in a lot of applications, not just security applications, but also image retrieval, indexing, and natural user interfaces (Ofualagba et al., 2018).

#### **5. Conclusion**

In a nutshell, all objectives are achieved in this project. This proposed system is believed to benefit students from all levels as it is such a convenient system, especially a class with a large number of students. Face recognition is more precise, quicker, and minimizes the likelihood of fraud attendance, compared to other methods.

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