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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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# 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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**REMACS 5.0**

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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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# IoT-Based Smart Chili Farm Monitoring Using Arduino and GSM Module

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## Abstract

This research has developed a wireless communication unit for transferring data from sensors, such as the DHT11 temperature and humidity sensor, the yl-69 soil moisture sensor, and the pH level sensor, in order to create a monitoring system for chili farms. The goal of this study is to establish a system for systematically gathering and managing data pertaining to chili farms. The goals of the IoT-based Smart Chili Farm Monitoring Using Arduino and GSM Module research is to provide farmers with the recognition that they need to be more vigilant in their monitoring of the chili plants. The purpose of this research is to design, build, and test a temperature, humidity, soil moisture, and soil pH level sensor-based alert system for a chili farm using an Arduino and a Global System for Mobiles (GSM) Module, and then to assess the system's functionality and applying the Technology Acceptance Model. This prototype is useful in allowing users to keep tabs on and modify variables including ambient temperature, humidity, soil moisture, and pH. In conclusion, this study has built an Internet of Things (IoT)-based Smart Chili Farm Monitoring system using Arduino and GSM Module to help farmers and other users.

*Keywords: humidity, temperature, soil moisture, pH level, Arduino, GSM Module, Internet of Things*

## 1. Introduction

Malaysian farmers and tribes grow chilli because chili can handle a range of planting, maintenance, fertilizer, irrigation, and pest control methods that farmers can grow with higher quality and cost. Chili farmers struggle to monitor soil conditions. Chili plants at UiTM Perlis quickly decay and give a poor crop due to the huge terrain and fluctuating climate. Farmers must maintain soil nutrients, and the lowest nutrient concentration is a measure of soil fertility, which affects plant growth and development. In this research, a sensor connected by the Internet of Things will measure pH, soil moisture, humidity, and temperature.

## 2. Methodology

There are six stages in total to the creation of this prototype which are information gathering, planning, design and development, implementation and testing, and documentation. Data were collected from the experiment that tested the reading of DHT11 temperature and humidity sensor, yl-69 soil moisture sensor and pH level sensor. Next, in testing we use various variables in different scenarios to find out the capabilities of the GSM SIM900A produced such as different distances and different service providers to do the performance testing and functionality testing of the sensors. This has been done three times to verify functionality of the prototype.

## 3. Results and Discussion

Through the data gathered during the testing, it has been clear that the functionality of smart monitoring systems using GSM-based IoT devices is successful as all the components work as planned. For the results of the research, we looked at how the system performed throughout testing and implementation. All IoT parts were used to their maximum potential, as proven by the functionality testing and network testing procedure. Finally, after all of the testing that has been done the prototype can enhance the farmers' job performance and the prototype successfully works.

#### 4. Novelty of Research / Product

There have been a number of studies that have been investigated to monitor the chili farm by using the IoT is being used in traditional agriculture methods (Hardyanto et al., 2021). The previous research for Application of Smart Greenhouse for Chilli Plant on Android in monitoring of microclimate conditions in the greenhouse have been done through the ThingView application on Android which is the sensor reading that can be monitored in real time (Fatimah et al., 2021). Besides, there are also implementations of IoT based soil pH, soil moisture, and temperature sensing devices. This measuring is able to successfully transfer analog data from the sensor to the ANTARES server by (Eka Sari et al., 2021). Soil monitoring software for both the web and Android was developed as part of this study to assist farmers in monitoring the farms. Finally, there is some research that has some method of our research but uses different platforms in sending the data to the user.

#### 5. Conclusion

In conclusion, this research achieving the objectives and the system of smart monitoring using GSM-based has successfully worked and has been tested. This technology reduces agricultural primitiveness. It will also let the farmer keep an eye on chili farms. This technology technically simplifies farmers in monitoring the farm.

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