

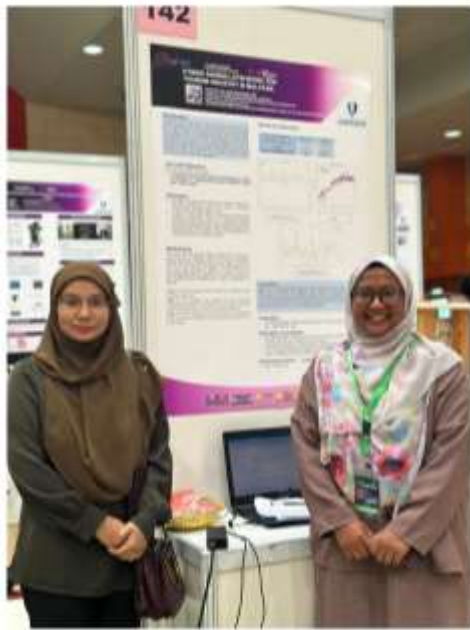
CITREX 2024 - Congratulations to all winners from PSM UMPSA

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Centre for Mathematical Sciences would like to congratulate the winners of the 14th Creation, Innovation, Technology & Research Exposition (CITREX 2024) which has been held on 8 – 9 May 2024 at Sport Complex, UMP Gambang Campus. In this exhibition, researchers submit their very best outcome of research projects, and at the same time to identify the potential projects to be participated in local and oversea exhibition.

List of winners from CMS are:

AWARD	TITLE	INVENTOR
SILVER	DYNAMIC MACHINE LEARNING SYSTEM FOR BEV CHARGING DEMAND PREDICTION	SYAHRIZAL SALLEH, ASSOC PROF DR ROSLINAZAIRIMAH ZAKARIA, DR SITI ROSLINDAR YAZIZ, NOOR FADHILAH AHMAD RADI
	RISKSmart Learning System	MOHD KHAIRUL HAFIZ KHAIRULDIN, ASSOC PROF DR NORHAYATI ROSLI, ASSOC PROF DR NORYANTI MUHAMMAD, IR UNAZIE ISKANDAR ABD RAZAK
	NONPARAMETRIC PREDICTIVE INFERENCE (NPI) FOREST FIRE DASHBOARD	ASSOC PROF DR NORYANTI MUHAMMAD, AMIRAH HAZWANI ROSLIN
	HEAT TRANSFER ALCHEMY: UNRAVELLING THE MATHEMATICAL INTRICACIES OF BLOOD HYBRID NANOFLUID	DR RAHIMAH JUSOH @ AWANG, KHO YAP BING, PROF DR MOHD ZUKI SALLEH, TS MOHD HISYAM MOHD ARIFF, PROF DR MIKHAIL SHEREMET, DR NOORAIN ZAINUDDIN
	GUI FOR N-TH ORDER LIMIT LANGUAGE USING FLUTTER FRAMEWORK	DR MUHAMMAD AZRIN AHMAD, SITI HAJAR MOHD KHAIRUDDIN
BRONZE	HYBRID SARIMA-LSTM MODEL FOR TOURISM INDUSTRY IN MALAYSIA	DR NORATIKAH ABU, SITI AI SHAH @ TSAMIENAH TAIB, TS DR AZLYNA SENAWI
	PRODUCT QUALITY OUTPUT MEASUREMENT DASHBOARD FOR PREVENTIVE MAINTENANCE ON COMPUTER NUMERICAL CONTROL (CNC)	AIZAT HAIKAL APANDI, MUHAMMAD AMIR AMINUDDIN, DR ADAM SHARIFF ADLI AMINUDDIN, DR KAMARULZAMAN MAHMAD KHAIRAI
	PREDICTIVE MAINTENANCE DASHBOARD FOR COMPUTER NUMERICAL CONTROL (CNC) MACHINES: ANALYZING TRENDS IN MACHINE DOWNTIME	MUHAMMAD AMIR AMINUDDIN, DR KAMARULZAMAN MAHMAD KHAIRAI, DR ADAM SHARIFF ADLI AMINUDDIN



HYBRID SARIMA-LSTM MODEL FOR TOURISM INDUSTRY IN MALAYSIA

Introduction: Tourism is one of the fastest growing economic sectors in the world, and it has been fast growing the year-to-year percentage to a high number of developing countries over the decades. Unfortunately, due to the COVID-19 pandemic in March 2020, the industry was badly hit and almost collapsed. In order to reduce the impact of the epidemic, economic activities and local industry in 2021 and beyond, an accurate forecast demand forecasting plan is vital for business.

Aims and Objectives:

- To enhance the tourism demand forecasting accuracy for Malaysia by proposing a hybrid SARIMA-LSTM model.

Motivation:

- Generally, the most time series data consist of linear and non-linear components, such as linear or nonlinear (Chang, 2010; Prasad & Sun, 2012).
- In any time series data with the combination of linear and nonlinear components, there is an essential individual forecasting model to approach that can forecast accurately.
- Therefore, the hybrid model which SARIMA model on the seasonal with LSTM model to capture the effectiveness of modeling time series forecasting model.

Methodology: The study will use monthly historical data of the number of tourist arrivals in Malaysia before the onset of Movement Control Order (MCO) starting from January 2000 to February 2020 due to the COVID-19 outbreak. The data collection for this study were provided by Ministry of Tourism, Arts and Culture Malaysia (MOTAC) database. The overall procedure of the proposed hybrid SARIMA-LSTM model is illustrated as follows:

Results and Discussion:

Forecast Evaluation	MAPE (%)	RMSE
SARIMA	11.33	17079.6
LSTM	8.88	14034.0
Hybrid SARIMA-LSTM	8.88	14034.0

Conclusion: Based on RMSE distribution, generated in Python software, the percentage error which a hybrid model proposed to hybrid SARIMA-LSTM model is more accurate compared to the performance score produced by individual SARIMA model and individual LSTM model. It can be concluded that the hybrid model can outperform and appropriate for the proposed solution for time series forecasting analysis.

Publication (in progress):

- The implementation of data science technology in tourism industry, with case study: hotel, museum, and...
- The implementation of a computer vision services for tourism industry in Malaysia: General Day Publishing (Pending review)
- Time series forecasting for tourism industry in Malaysia: Data Publication
- Tourism demand forecasting in Malaysia using SARIMA and long short-term memory (LSTM)

Acknowledgment: The author would like to thank the Ministry of Tourism, Arts and Culture Malaysia (MOTAC) for providing the data used in this study.



Product Quality Index Management Framework for Precision Machining on Computer Numerical Control (CNC) Machines

Product Background:

Ensuring a high-quality production quality through a systematic approach is a key objective for any manufacturing organization in the modern era. The Product Quality Index (PQI) is a key performance indicator (KPI) that measures the quality of a product. The PQI is a key performance indicator (KPI) that measures the quality of a product. The PQI is a key performance indicator (KPI) that measures the quality of a product.

Methodology:

The study will use a systematic approach to develop a Product Quality Index Management Framework for Precision Machining on Computer Numerical Control (CNC) Machines. The study will use a systematic approach to develop a Product Quality Index Management Framework for Precision Machining on Computer Numerical Control (CNC) Machines.

Results:

The study will use a systematic approach to develop a Product Quality Index Management Framework for Precision Machining on Computer Numerical Control (CNC) Machines. The study will use a systematic approach to develop a Product Quality Index Management Framework for Precision Machining on Computer Numerical Control (CNC) Machines.

Conclusion:

The study will use a systematic approach to develop a Product Quality Index Management Framework for Precision Machining on Computer Numerical Control (CNC) Machines. The study will use a systematic approach to develop a Product Quality Index Management Framework for Precision Machining on Computer Numerical Control (CNC) Machines.

Publication:

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Big clap to all the winners!!

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