



## RESEARCHER PROFILE

Scopus<sup>®</sup> 56737087400

ORCID 0000-0001-9512-7191

Google scholar MAHARANI BINTI ABU BAKAR

## EDUCATION



- PhD in Mathematical Sciences, University of Essex, UK
- Master in Applied Mathematics, Universitas Gadjah Mada, Indonesia
- BSc. in Mathematics, Universitas Gadjah Mada, Indonesia

## AREAS OF EXPERTISE

- Artificial Neural Networks
- Physics-Informed Neural Networks
- Machine Learning
- Numerical Analysis

## SUPERVISION



## COLLABORATORS



# DR. MAHARANI ABU BAKAR

## SENIOR LECTURER

Dr. Maharani's interests include numerical analysis, artificial neural networks (ANNs), and machine learning. Recently, she has been working on hybrid models ANNs for solving differential equations (ODE and PDE) and several problems using Machine Learning. She has authored and co-authored for more than 30 research articles in the high impact journals such as Elsevier, IEEE, and Taylor and Francis publishers. She is editors in AIP proceeding conference, JMSI journal under UMT, and a journal under Elsevier. She was active in networking with international researchers.

## CONTACT

+013-4141389

maharani@umt.edu.my

fskm.umt.edu.my

## SELECTED RESEARCH PROJECTS

- ✓ Fundamental Research Grant Scheme (FRGS) from Ministry of Higher Education Malaysia. A New Neurosoft-Computing Based on Greenformer Matrix Factorization of High Dimensional Partial Differential Equations for Ecological Modelling (2022 - 2025). RM75,020.
- ✓ International Partnership Research Grant (IPRG) from Universiti Malaysia Terengganu and Universitas Ahmad Dahlan. An Adaptive Physics-Informed Neural Network With The Cat and Mouse Based Optimizer As A New Soft Computing Paradigm For Solving High Dimensional Partial Differential Equations. (2022-2025). RM100,000.
- ✓ Research Internship Grant (RIG) from Universiti Malaysia Terengganu. Hybrid PCA-MEIEMLA to Handle Large Data Problem in the Linear System. (2019-2021). RM33,700

## SELECTED PUBLICATIONS

- ✓ Alfi Bela Kurniati, **Maharani A Bakar**, Nur Fadhilah Ibrahim, Hanani Farhad Harun (2025), Enhancing artificial neural network learning efficiency through Singular value decomposition for solving partial differential equations, Results in Applied Mathematics, 25(2025): 100522.
- ✓ Nursyva Irsalinda, **Maharani A Bakar**, Fatimah Noor Harun, Sugiyarto Suroño, Danang A Pratama (2025), A new hybrid approach for solving partial differential equations: Combining Physics-Informed Neural Networks with Cat-and-Mouse based Optimization, Results in Applied Mathematics, 25(2025): 100539
- ✓ Danang A Pratama, **Maharani A Bakar**, A. Salhi, Ummu Atiqah Mohd Roslan, Sugiyarto (2024), Numerical solutions of sea turtle population dynamics model by using restarting strategy of PINN-Adam, Results in Applied Mathematics, 22(5): 100457
- ✓ Danang A Pratama, **Maharani A Bakar**, A. Salhi, Rewayda Razaq, Nur Fadhilah I (2023), Solving partial differential equations with hybridized physic-informed neural network and optimization approach: Incorporating genetic algorithms and L-BFGS for improved accuracy, Alexandria Engineering Journal, 77(6):205-226
- ✓ Danang A Pratama, **Maharani A Bakar**, Idris R, N Mohamed, Nur Fadhilah I (2023), Physical restriction neural networks with restarting strategy for solving mathematical model of thermal heat equation for early diagnose breast cancer, Results in Applied Mathematics, 19(2):100384

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