

ZOREN P. MABUNGA

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EDUCATION

Ph.D., Electronics Engineering, Mapúa University, (Candidate)

Scholarship: *Department of Science and Technology – Engineering Research and Development for Technology (DOST-ERDT) Scholarship*

M.S., Electronics Engineering, Mapúa University, 2019

Scholarship: *Department of Science and Technology – Engineering Research and Development for Technology (DOST-ERDT) Scholarship*

B.S, Electronics Engineering, Southern Luzon State University, 2014

Scholarship: *Department of Science and Technology – Science Education Institute (DOST-SEI) Scholarship*

PROFESSIONAL EXPERIENCE

Freelance AI Developer/Data Scientist

Develops and utilizes AI models and applications such as video transcription, data cleaning, email content generator, document summarization, and grant proposal draft generator. Provide and generate insights from the client's available data.

Assistant Professor, Southern Luzon State University (2023 – present)

Courses: Transmission Media and Antenna Systems, Electromagnetics, Logic Circuits and Switching Theory, Differential Equations, Advanced Engineering Mathematics

Instructor, Southern Luzon State University (2015 – 2023)

Courses: Transmission Media and Antenna Systems, Electromagnetics, Logic Circuits and Switching Theory, Differential Equations, Advanced Engineering Mathematics

PUBLICATIONS

Journal Publications

1. **Title:** "A Comparative Analysis of Advanced Routing and Cluster Head Selection Algorithm Using Lagrange Interpolation"

Authors: Zoren P Mabunga, Jennifer C Dela Cruz, Renato R Maaliw III,
Journal & Year: Telecom, 2024

2. **Title:** "Chronological wild geese optimization algorithm for cluster head selection and routing in wireless sensor network"
Authors: Zoren P Mabunga, Jennifer C Dela Cruz
Journal & Year: International Journal of Communication Systems, 2024

Conference Proceedings Publication

1. **Title:** "Deep Recurrent Neural Network for Time Series Modelling of Energy in Wireless Sensor Network Nodes"
Authors: Zoren P. Mabunga, Jennifer C. Dela Cruz
Conference & Year: 2024 IEEE 15th Control and System Graduate Research Colloquium (ICSGRC), 2024
2. **Title:** "An Enhanced Segmentation and Deep Learning Architecture for Early Diabetic Retinopathy Detection"
Authors: Renato R. Maaliw, Zoren P. Mabunga, Maria Rossana D. De Veluz, Alvin S. Alon, Ace C. Lagman, Manuel B. Garcia, Luisito Lolong Lacatan, Rhowel M. Dellosa
Conference & Year: 2023 IEEE 13th Annual Computing and Communication Workshop and Conference (CCWC), 2023
3. **Title:** "Golden Apple Snail 'Kuhol' Eggs Detection Using MATLAB Image Processing"
Authors: Bethrina Ira A. Carreon, Camille Y. Dequito, Cristel Joyce M. Esmerna, Zoren P. Mabunga, Jennifer C. Dela Cruz, Renato R. Maaliw, Alejandro H. Ballado
Conference & Year: 2022 IEEE 14th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM), 2022
4. **Title:** "Population Estimation Using Wi-Fi's Received Signal Strength Indicator Based on Artificial Neural Network"
Authors: Brian Aaron R. Bermudez, Carloui R. Cruz, Jushua D. Ramos, Zoren P. Mabunga, Jennifer C. Dela Cruz, Renato R. Maaliw III, Alejandro H. Ballado
Conference & Year: 2022 6th International Conference on Electrical, Telecommunication and Computer Engineering (ELTICOM), 2022
5. **Title:** "An Optimized Soil Moisture Prediction Model for Smart Agriculture Using Gaussian Process Regression"
Authors: Zoren P. Mabunga, Jennifer C. Dela Cruz
Conference & Year: 2022 IEEE 18th International Colloquium on Signal Processing & Applications (CSPA), 2022
6. **Title:** "An Ensemble Machine Learning Approach for Time Series Forecasting of COVID-19 Cases"
Authors: Renato R. Maaliw, Melvin A. Ballera, Zoren P. Mabunga, Aubee T. Mahusay, Dhenalyn A. Dejel, Mariebeth P. Seño
Conference & Year: 2021 IEEE 12th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON), 2021
7. **Title:** "Time-Series Forecasting of COVID-19 Cases Using Stacked Long Short-Term Memory Networks"

Authors: Renato R. Maaliw, Zoren P. Mabunga, Frederick T. Villa

Conference & Year: 2021 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT), 2021

8. **Title:** "The Optimization of a 5G Inset-Fed Patch Antenna Using the Machine Learning Algorithm Surrogate Model Assisted Differential Evolution for Antenna Synthesis"

Authors: Angelica Cordero-Samortin, Jennifer Dela Cruz, Zoren P. Mabunga

Conference & Year: 2021 IEEE 4th International Conference on Computer and Communication Engineering Technology (CCET), 2021

9. **Title:** "Utilization of Different Wireless Technologies' RSSI for Indoor Environment Classification Using Support Vector Machine"

Authors: Zoren P. Mabunga, Jennifer C. Dela Cruz, Angelica C. Samortin, Renato R. Maaliw

Conference & Year: 2021 IEEE 12th Control and System Graduate Research Colloquium (ICSGRC), 2021

10. **Title:** "Development of Sanitary Landfill's Carbon Dioxide Concentration Models Using Machine Learning Algorithms"

Authors: Zoren P. Mabunga, Jennifer C. Dela Cruz, Glenn Magwili, Angelica C. Samortin

Conference & Year: 2020 IEEE 12th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM), 2020

11. **Title:** "The Effect of Various Ultra High Frequency Radiation on the Evolution of the *Staphylococcus Aureus*"

Authors: Angelica Cordero-Samortin, Jennifer C. Dela Cruz, Ramon Garcia, Zoren P. Mabunga

Conference & Year: 2020 IEEE 12th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM), 2020

12. **Title:** "Development of Sanitary Landfill's Groundwater Contamination Detection Model Based on Machine Learning Algorithms"

Authors: Zoren P. Mabunga, Jennifer C. Dela Cruz, Glenn Magwili, Angelica C. Samortin

Conference & Year: 2020 IEEE 12th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM), 2020

13. **Title:** "The Analysis of *Staphylococcus aureus* Bacteria After Exposure to Electromagnetic Radiation via Support Vector Machine"

Authors: Angelica Cordero-Samortin, Jennifer C. Dela Cruz, Ramon Garcia, Zoren P. Mabunga

Conference & Year: 2020 IEEE 12th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM), 2020

14. **Title:** "Greenhouse Gas Emissions and Groundwater Leachate Leakage Monitoring of Sanitary Landfill"

Authors: Zoren P. Mabunga, Glenn Magwili

Conference & Year: 2019 IEEE 11th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM), 2019

AWARDS AND HONORS

Outstanding Research – “Chronological Wild Geese Migration Optimization Algorithm for CH selection and Routing in WSN”, Agency In House Review (AIHR), Southern Luzon State University (October, 2024)

Best Research Paper – “An enhanced segmentation and deep learning architecture for early diabetic retinopathy detection”, 2023 IEEE 13th Annual Computing and Communication Workshop and Conference (CCWC) (March 8, 2023)

Best Presenter - “Population estimation using Wi-Fi’s received signal strength indicator based on artificial neural network”, 2022 6th International Conference on Electrical, Telecommunication and Computer Engineering (ELTICOM) (Nov. 22, 2022)

Best Research Paper – “Time-Series Forecasting of COVID-19 Cases Using Stacked Long Short-Term Memory Networks”, International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (Sept. 29-30, 2021)

Best Research Paper – “Time-Series Forecasting of COVID-19 Cases Using Stacked Long Short-Term Memory Networks”, International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (Sept. 29-30, 2021)

Academic Excellence in Science and Technology – DOST-SEI (2021)

ECT Licensure Examination – 2nd Placer (2017)

DOST Scholarship Awardee – BSECE, MSECE, PhD., ECE

SKILLS/TECHNOLOGY STACK

Python, Google BigQuery, SQL, TensorFlow, scikit-learn, PyTorch, Pandas, NumPy, GitHub, GPT Models, LangChain, HTML, CSS, Streamlit

PROFESSIONAL LICENSES AND CERTIFICATIONS

Licensed Electronics Engineer

Licensed Electronics Technician

Huawei Certified ICT Associate – Artificial Intelligence

Huawei Certified ICT Associate – Cloud Computing

PROFESSIONAL MEMBERSHIPS

- National Research Council of the Philippines (NRCP) – (Associate Member)
- Institute of Electrical and Electronics Engineers (IEEE) – Philippines Section (Graduate Student Member)
- Institute of Electronics Engineers of the Philippines (IECEP) – Quezon Province Chapter (Regular Member)