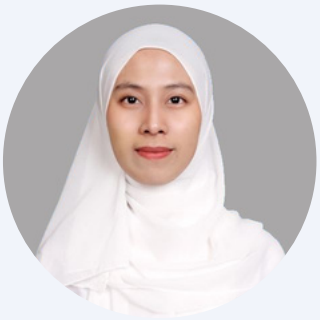
FAKHIRA RIFANTI MAULANA



RESEARCHER

Fakhira.RifantiMaulana@Wetsus.nl

Indonesian | Date of Birth: 21 October 1995 | fakhira.maulana@wur.nl

EDUCATION

Des 2024 - present

PhD Candidate
Wetsus, European centre of excellence for sustainable water technology
Wageningen University and Research (WUR), The Netherlands

- Project Title: Real-Time Monitoring of Soil and Surface Water Qaullity

2022-2024

MSc Biosystems Engineering
Wageningen University and Research (WUR), The Netherlands

- Thesis Track: Mathematical and Statistical Methods
- Relevant courses: System Identification: Learning for Decision and Control, Modelling of Biobased Production Systems, Quantitative Analysis of Innovative Biosystems, and Advanced Agronomy

2013-2017

BSc Agricultural Engineering
Bandung Institute of Technology, Indonesia

- Thesis Title: “Pre-design of Oil Palm Plantation System Integrated with Cover Crops and Vermicomposting”
- Relevant courses: Plant Growth Modelling, Agroclimatology, Land and Water Resources Engineering, Transport Phenomena in Biosystem, Mass and Energy Balances in Biosystem

LANGUAGE SKILLS

- Indonesia (Native)
- English (Fluent)

PROFESSIONAL SKILLS

- Programming skills in MATLAB, R, and Phyton
- Mathematical Modelling
- Machine Learning
- Crop Growth Modelling

SCIENTIFIC INTEREST

- Modelling of Agricultural Systems
- Physics-Guided Machine Learning (Data-Driven and Physical-Based Modelling)

RESEARCH EXPERIENCES

February 2024 - Present

Researcher

Precision Farming Project for Smart Village

Walungan Bhakti Nagari (NGO), Indonesia

Developing a physics-based model to predict lettuce growth for farming decision-making in smallholder farmers, such as suitable planting time and irrigation needs. My approach is to apply a generic crop growth model and soil water balance model (supported by real-time local weather data and crop field data).

August 2023 - Present

Researcher

Strawberry Growth Prediction in Bamboo-based Greenhouse

Obayashi Corporation, Indonesia Branch

Developing a physics-based model for greenhouse strawberry crops to predict their growth and fruiting cycle, and determine precise crop management decisions related to pruning management, fertilizer, and irrigation.

August 2023 - January 2024

MSc Research Practice at Biometris WUR

Improving Potato Yield Estimation through Physics-Guided System Identification with Hybrid Approach

Supervisor: Xiaodong Cheng and Sjoerd Boersma (Grade 8.0)

Focused on identifying an accurate, interpretable, and sparse dynamical potato growth model for data assimilation. My approach was integrating the data-driven sparse identification with the potato growth model as a constraint to fine-tune the model. I adapted a switching mechanism (hybrid model) to capture phenological phases.

January 2023 - July 2023

MSc Thesis Research at Biometris WUR

System Identification of a Greenhouse Crop Model using the Physics-Informed Machine Learning Algorithm

Supervisor: Xiaodong Cheng and Sjoerd Boersma (Grade 8.5)

Researched identifying greenhouse crop dynamical models that are accurate, sparse, and interpretable, suitable for adaptive greenhouse climate control. I applied a new physics-guided machine learning, combining the sparse identification method with the biophysical insights from the greenhouse crop model to guide the optimization process.

January 2023 - July 2023

Research Assistant

Sustainability Analysis of Dairy-Horticulture Integrated Farming System

Bandung Institute of Technology

Evaluated the sustainability status of integrated farming system in smallholder agriculture according to 5 dimensions (ecology, economy, social, technology, and institutional) using multidimensional scaling approach.

SCIENTIFIC PUBLICATON

M. Rosmiati, R. E. Putra, T. Lastini, E. Hernawan, Pujo P., I. Rahmayunita, **F. R. Maulana**, F. Liesdiana, M. A. Nurdiansyah, and A. Azis. Sustainability Analysis of Dairy-Horticulture Integrated Farming System. (2020). The Journal of Agricultural Sciences – Sri Lanka (15): 2. DOI: 10.4038/jas.v15i2.8813

SCIENTIFIC PRESENTATIONS

16 Nov 2023 — ***Scientific Machine Learning Application for Greenhouse Crop Modelling***
Presenter at Wageningen University Model and Data Day Seminar, organized by WUR, The Netherlands

23 Aug 2023 — ***System Identification of the Crop Greenhouse System using Physics-Informed SINDy-PI Machine Learning (ML) Algorithm***
Poster Presenter at the 9th Channel Network Conference 2023, organized by International Biometric Society (IBS Channel Network), The Netherlands

6 June 2023 — ***System Identification of the Crop Greenhouse System using Physics-Informed SINDy-PI Machine Learning (ML)***
Presenter at the 5th meeting of Scientific Machine Learning Network (SciML), organized by Scientific Machine Learning Network WUR, The Netherlands (www.sciml.wur.nl)

4-5 Sept 2019 — ***Sustainability Analysis of Dairy-Horticulture Integrated Farming System***
Presenter at the 10th International Conference on Global Resource Conservation (ICGRC), organized by Brawijaya University, Indonesia

ACHIEVEMENTS

- Awardee of the Indonesia Endowment Fund for Education (LPDP) Scholarship (2021)
- Outstanding Student of the Agricultural Engineering Study Program at ITB (2016)
- The Dean's List for the 2015/2016 Academic Year (2016) issued by School of Life Sciences and Technology Faculty, ITB
- Awardee of Academic Achievement Improvement (PPA) Scholarship (2015) issued by ITB

EXTRA-CURRICULAR ACTIVITIES

2022-2024

Board Member of Avicenna: International Muslim Student Associations

Collaborated with international students at WUR to organize Muslim's activity and promoted Avicenna's activities through interactive and creative social media publication

2022-2024

Member of Indonesian Student Association in Wageningen

Promoted Indonesia's culture by performing 'Angklung' (Indonesia traditional musical instrument) in international events, such as One World Week by WUR in 2023.

Feb 2023 - present

Academic Mentor

Lingkar Bina Muda, Youth Empowerment Community

Provide guidance and advice on studying for university students including sharing about scholarship tips

May 2016 – Apr 2017

Head of Media, Communication, and Information Department

Agricultural Engineering Student Union (HIMAREKTA) ITB

Led multimedia broadcasting, creative publication design, and content management

Oct – Nov 2015

Vice-Chairman of Grand Seminar on Socialization of The Agricultural Development Strategy (SIPP) 2015-2045

Agricultural Engineering Student Union (HIMAREKTA) ITB

Supervised 6 divisions by coordinating job relations, monitoring, and evaluating activities

May - Aug 2015

Head of Closing Division

Ceremonial Department, Open House Unit (OHU) ITB

Coordinated and synergized internal staff, cultural units, design and production team, and performer to hold the closing ceremony event

Apr 2015 - Aug 2016

Participant and Committee

KKN-T (Thematic Field Study and Community Service) ITB

- Collaborated with students and rural communities to establish public sanitation facilities to solve water scarcity program at Cikuya, Tasikmalaya
- Designed creative publication content in social media to report activities