

# Gabriel Jonathan

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## Profile

A Mathematics graduate student from Institut Teknologi Bandung. Dedicated to computational fluid dynamics, scientific machine learning, mathematical and statistical modelling/simulations.

## Education

### Institut Teknologi Bandung

M.Si, Mathematics

- CGPA : 3.86/4.00
- Enrolled in the Fast Track Program. GTA 100 Scholarship Awardee.

Bandung, Indonesia

Aug 2022 - NOW

### Institut Teknologi Bandung

S.Si, Mathematics

- Cumlaude. CGPA : 3.89/4.00
- **Courses:** Data Analysis, Deep Learning, Probability Theory, Mathematical Statistics, Mathematical Modelling, Linear Algebra, Coding Theory

Bandung, Indonesia

Aug 2018 - July 2022

## Work Experience

### Witteveen+Bos

Project Intern

- Collaborated with a team of engineering consultants to develop a numerical simulation and analysis for a project
- Gathered and analyzed the required data for the simulation
- Tech used : MATLAB, HEC-RAS

Jakarta, Indonesia

April 2022 - June 2022

### Zenius

Content Operations Intern

- Managing the trackers for Zenius's content creation, including the timelines
- Created dashboard for monthly report
- Quality control, ensuring all published contents comply to the desired standards
- **Tech used:** Excel, Google Data Studio, SQL

Jakarta, Indonesia

June 2021 - Aug 2021

### Institut Teknologi Bandung

Head of Differential Equations Laboratory

- Managed the whole operation of Differential Equations Laboratory in ITB
- Created tasks and modules for over 150+ ITB students.
- **Tech used:** Python with NumPy, Matplotlib, Pandas, SymPy, LaTeX

Bandung, Indonesia

Jan 2023 - NOW

### Institut Teknologi Bandung

Head of Numerical Mathematics Laboratory

- Managed the whole operation of Numerical Mathematics Laboratory in ITB
- Created tasks and modules for over 100+ ITB students.
- **Tech used:** MATLAB, LaTeX

Bandung, Indonesia

Aug 2020 - Dec 2021

### Institut Teknologi Bandung

Grading Assistant

- Responsible to evaluate student's task which consisted of exercises, quizzes, and projects for various courses at ITB.
- Courses : Calculus, Simulation and Computational Mathematics, Differential Equations, Numerical Mathematics, Real Analysis, Computational Fluid Dynamics

Bandung, Indonesia

Aug 2020 - NOW

## Projects and Publications

### Water Waves Resonance and Its Interaction with Submerged Breakwater

Institut Teknologi Bandung

March 2022

- DOI : <https://doi.org/10.1016/j.rineng.2022.100343>
- A research in computational fluid dynamics, observing the wave resonance phenomenon in basins with breakwater. Numerical simulations were conducted using MATLAB

## Shoaling Wave Modelling using Physics Informed Neural Networks (PINNs)

Institut Teknologi Bandung

Jan 2023

- Developed a neural network model to approximate the solution to PDEs, specifically in this project, the shallow water equations (SWE) to simulate the wave shoaling phenomenon on basins.
- Presented at SEA The Future 2023, an International Conference held in Pattaya, Thailand

## Algorithmic Financial Stocks Trading using Convolutional Neural Networks

Institut Teknologi Bandung, MA4072 Deep Learning

May 2022

- A deep learning project. Transforming a problem in stock trading into an image classification problem.
- The model is built using PyTorch. An accuracy of a 80% is attained

## Machine Learning Model for COVID-19 Awareness Index Classification in Indonesia

Institut Teknologi Bandung, MA3271 Mathematical Modelling

May 2021

- A mathematical modelling project. Observing the math behind numerous machine learning models, then applied those models to classify regions in Indonesia based on its inhabitant's awareness to the COVID-19 pandemic.
- Analyzing the COVID-19 cases data from various regions in Indonesia.

## Skills

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<b>Programming</b>	Python (Pandas, PyTorch, NumPy, Scikit-learn. etc.), MATLAB, SQL, R(ggplot2), HTML/CSS, JavaScript, Maple
<b>Miscellaneous</b>	LaTeX (Overleaf/R Markdown), Microsoft Office, Machine Learning, Deep Learning, Numerical Simulation, Mathematical and Statistical Modelling
<b>Certifications</b>	Data Analyst with Python (DataCamp), Data Scientist with Python (DataCamp)

## Organizations

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### Mathematics Corporation (MATHCO) ITB

Chief Executive Officer (CEO)

Nov 2020 - Nov 2021

- MATHCO is the publisher of the most popular calculus, statistics, and linear algebra tutorial book in ITB.
- Managed the whole operation of MATHCO ITB
- Supervised all department and their task, from budgeting to building collaboration with other parties

### HIMATIKA ITB

Academic and Sciences Division Staff

Nov 2019 - July 2022

## Achievements

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### Gold Medalist and Best Presenter

Mathematical Analysis and Geometry Day (MAGD) XIII ITB

2022

A national mathematical analysis and geometry competition held by the Analysis and Geometry Research Group ITB. Competed against more than 300 participants.

### Best Presenter

4th International Conference on Applied Sciences, Mathematics and Informatics (ICASMI)

2022

International Conference on Applied Science Mathematics and Informatics, participated by more than 150 participants from all over the world.

### Meritorious Award

SCUDEM VI Challenge

2021

International Mathematical Modelling contest held by SIMIODE. Our team of 3 competed against more than 3000 participants from 12 countries. Achieved top 60% of all participants.

### Successful Participant

Mathematical International Modelling (MCM) 2022

2022

An international mathematical modelling competition. Competed against more than 15000 participants from 7 different countries.

### Participant

SEA The Future International Conference 2023

2023

An international conference held in Pattaya, Thailand. Presenting the topic of "Wave Shoaling Phenomenon Modelling using Physics Informed Neural Networks (PINNs)".

### Dean List

Faculty of Mathematics and Natural Sciences (FMIPA) ITB

2018-2022

Award given for students with excellent academic achievement. Received the award multiple times in 2018-2022 period.