

Alfiyandy Hariansyah

Institute of Fluid Science, Tohoku University | +817041763092
muhammad.alfiyandy.hariansyah.s8@dc.tohoku.ac.jp

EDUCATION

TOHOKU UNIVERSITY

MENG IN AEROSPACE ENGINEERING

Oct 2021 - Present | Sendai, Japan

TOHOKU UNIVERSITY

BENG IN MECHANICAL AND

AEROSPACE ENGINEERING

Oct 2017 - Sept 2021 | Sendai, Japan

Overall GPA: 3.62 / 4.0

LINKS

Github:// [alfiyandyhr](#)

LinkedIn:// [alfiyandy-hariansyah](#)

RESEARCH

Aircraft Design • Aerodynamic Design
Surrogate Modeling • Machine Learning
Multidisciplinary Optimization

SKILLS

PROGRAMMING

Proficient

Python • C • Matlab/Simulink

Knowledgeable

C++ • HTML5 • CSS3 • LaTeX

ML & DATA SCIENCE

NumPy • pandas • Scikit-Learn

PyTorch • TensorFlow • Pymoo

3D GEOMETRY

PyGeo • SolidWorks • FreeCAD

CFD & MESHING

SU2 • ADflow • Pointwise

VISUALIZATION

Matplotlib • Tecplot • Paraview

LANGUAGES

English (full professional)

Japanese (limited working)

Indonesian (native)

INTERESTS

Sustainable Aviation
Urban Air Mobility • eVTOL
Business • Startups
Traveling • Mobile Games

EXPERIENCE

FLUIDS ENGINEERING WITH DATA SCIENCE LAB

| RESEARCHER

Apr 2020 – Sep 2023 | Sendai, Japan

- Worked on several collaborative research projects.
- Presented at several domestic and international conferences.

RESEARCH PROJECTS

ANN-ASSISTED GENETIC ALGORITHM FOR AIRFOIL DESIGN

Python, C, SU2, Pointwise, PyTorch, Pymoo, Paraview

Apr 2020 – Sep 2021 | Funded by the Fugaku Supercomputer Project

- Developed an optimization framework that utilizes a dynamically retrained multilayer perceptron combined with NSGA-II optimizer.
- Applied the framework to several airfoil design cases.
- Automated the meshing process in Pointwise using Glyph API for Python.
- Conducted Euler-based CFD analyses using SU2.

DEEP LEARNING TECHNIQUES FOR 3D WING DESIGN

Python, C, ADflow, PyGeo, PyTorch, FreeCAD, Tecplot

Oct 2021 – On going | Funded by the Boeing Higher Education Program

- Developed a DCGAN-based method to produce synthetic wing designs.
- Developed a CNN-based geometric filtering method to filter out abnormal designs with poor aerodynamic performances.
- Automated the optimization process and ran it on a supercomputer system.
- Conducted RANS-based CFD analyses using ADflow.

HONORS & AWARDS

2017 - 2021 Japanese Government (MEXT) Scholarship Awardee

2021 Best presentation at the 18th ICFD, Sendai, Japan

2021 - 2023 Mizuho International Foundation Scholarship Awardee

PUBLICATIONS

- Hariansyah, M. A., and Shimoyama, K., "An Artificial Neural Network-Assisted Genetic Algorithm With Application to Multi-Objective Transonic Airfoil Shape Optimization," *JAXA Special Publication: Proceedings of the 53rd Fluid Dynamics Conference/39th Aerospace Numerical Simulation Symposium*, 2022, pp. 115-124, JAXA-SP-21-008, ISSN 2433-2232.
- Inaba, Y., Date, S., Hariansyah, M. A., Abe, Y., Shimoyama, K., Okabe, T., and Obayashi, S., "Optimizing Structural Placement in Wing Design for Composite Aircraft," *Proceedings of the 53rd Fluid Dynamics Conference/39th Aerospace Numerical Simulation Symposium*, 2021, JSASS-2021-2069-A.
- Hariansyah, M. A., and Shimoyama, K., "On the Use of a Multilayer Perceptron Based Surrogate Model in Evolutionary Optimization," *The Proceedings of the Computational Mechanics Conference*, 2021, Vol. 2021.34, Session ID 235, Online ISSN 2424-2799, DOI:10.1299/jsmecmd.2021.34.235.
- Hariansyah, M. A., and Shimoyama, K., "Deep Learning Techniques for High Dimensional Surrogate-Based Aerodynamic Design," *33rd Congress of the International Council of the Aeronautical Science*, 3 - 8 September 2022, Stockholm, Sweden. (to be presented)