Takumi Endo

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https://takuendo.github.io/

PROFILE

- CFD engineer with a strong background in LES, wall modeling, and data-driven CFD for aerodynamic applications.
- Proficient in CFD and machine learning, including their integrated applications.
- Capable of translating advanced CFD and machine-learning methods toward practical tools for industrial aerodynamic applications.

EDUCATION

Jan. 2026 – present: Ph.D. candidate in Chair of Aerodynamics and Fluid Mechanics TUM School of Engineering and Design – Technical University of Munich at Munich, Germany
- Development of a Wall Model for Large Eddy Simulation with Generative Adversarial Networks for Applications in Vehicle Aerodynamics
- Fully funded by Studienstiftung des deutschen Volkes

Apr. 2025 – Dec. 2025: Ph.D. candidate in Mechanical Engineering – The University of Tokyo at Tokyo, Japan
- JST Support for Pioneering Research Initiated by the Next Generation (SPRING) Program, The University of Tokyo
- Program suspended due to transfer to the Technical University of Munich (TUM)

Apr. 2023 – Mar. 2025: Master of Engineering in Mechanical Engineering – The University of Tokyo at Tokyo, Japan (GPA: 3.84/4)
- Developed a GAN-based wall model for LES, integrating machine learning into OpenFOAM CFD workflows
- Built surrogate models for wind-assisted ship propulsion systems (rigid sails, rotor sails) using CFD data

Sep. 2023 – Feb. 2024: Exchange program in Aeronautical Engineering – Politecnico di Milano at Milan, Italy
- Conducted CFD analysis of a Formula 1 DRS system to optimize aerodynamic performance

Apr. 2019 – Mar. 2023: Bachelor of Engineering in Mechanical Engineering – The University of Tokyo at Tokyo, Japan

INTERNSHIP

Oct. 2022 – Present: CFD Engineer at TotalSim Japan Inc. at Tokyo, Japan
- Conducted external aerodynamic analyses of motorsport cars and racing motorcycles
- Set up simulation cases and meshes in OpenFOAM
- Post-processed results using ParaView, Excel, and Python/Linux scripts

EXTRACURRICULAR ACTIVITIES

Nov. 2023 - Mar. 2024: Aerodynamics Engineer at Polimi Motorcycle Factory (PMF)
- Belonged to Aerodynamics department in the official team of Politecnico di Milano competing in MotoStudent
- Conducted steady simulations, analyzed results, and developed rotating models of transient simulations

JOURNAL PUBLICATIONS

Jan. 2026: Manuscript in preparation for submission to Physics of Fluids (LES / wall modeling)

Dec. 2025: Endo, T. and Guzelbulut, C., “Performance Analysis of Interacting Rigid Wind Sails and Rotor Sails by Kriging Surrogate Model", Journal of ETA Maritime Science, 2025.

CONFERENCE PRESENTATIONS (peer reviewed)

Nov. 2025: Endo, T., et al., " Development of a GANs-Based Wall Model for Large Eddy Simulation Using Local Flow Information", 36th Parallel CFD international conference 2025 (ParCFD36), 2025, Merida, Mexico, Oral presentation.

Sep. 2025: Endo, T., et al., "Development of GANs-based Wall Model for Large Eddy Simulation of Wall-Bounded Flow", 15th International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements (ETMM-15), 2025, Dubrovnik, Croatia, Oral presentation.

AWARDS

Mar. 2026: Doctoral Scholarship by Studienstiftung des deutschen Volkes

Mar. 2025: Outstanding Presentation Award at the 40th IIS TSFD Symposium, Tokyo, Japan

Aug. 2023: Continental UTokyo-IIS Global Engineering Fellowship – The University of Tokyo and Continental Japan

SKILLS

- Language:
  - Japanese (native), English (advanced), German (beginner)
- CFD Methods:
  - LES / WMLES, wall modeling, external aerodynamics
- CFD Tools:
  - OpenFOAM (3+ years) — finite-volume solvers, solver customization, wall-model integration, case setup, automation
- Machine Learning for CFD:
  - GAN — development of ML-based wall models and implementation in OpenFOAM
  - PINN — reproducing the unsteady flow using PINN
- Programming & Data Processing:
  - Python (3+ years) — data processing, automation, visualization
  - MATLAB / Simulink (2+ years) — numerical analysis, ship modeling, control optimization