Beverley K.W. YEO

Curriculum Vitae

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Research Interests: High-performance computing, GPU programming, and higher-order numerical methods for compressible fluid flows with applications to aerodynamics and aircraft propulsion.

EDUCATION

Stanford University, Stanford, CA, USA
Doctor of Philosophy (Mechanical Engineering) — Sep 2023 - present
Advisor: Prof. Matthias IHME — CGPA: 3.90/4.00

Nanyang Technological University, Singapore (NTU)
Master of Engineering (Mechanical & Aerospace Engineering) — Aug 2021 - Feb 2023
Advisor: Prof. Wai Lee CHAN — CGPA: 4.63/5.00
Thesis: Investigating Galilean invariance in CFD

Bachelor of Engineering (Aerospace Engineering, Honors with Distinction) — Aug 2017 - Jun 2021
Advisor: Prof. Daniel NEW — CGPA: 4.37/5.00
Thesis: On the flow behavior of confined vortex-rings

Purdue University, West Lafayette, IN, USA – *Study abroad* — Jan 2020 - May 2020

PROFESSIONAL EXPERIENCE

Graduate Research Assistant — **Sep 2023 - present**
Supervisor: Prof. Matthias IHME
Department of Mechanical Engineering, Stanford University, Stanford, CA, USA
- Development of hardware-independent discontinuous Galerkin methods using Python and JAX
- Optimization of discontinuous Galerkin codes for parallel high-performance computers
- Investigations of machine-precision and floating-point errors in higher-order numerical methods
- GPU acceleration of discontinuous Galerkin methods for compressible flows

Research Engineer — **Aug 2022 - Aug 2023**
Supervisor: Dr. Daniel WISE, Dr. Vinh-Tan NGUYEN
Fluid Dynamics Department, Institute of High Performance Computing (IHPC)
*Agency for Science, Technology And Research (A*STAR), Singapore*
- Integration of harmonic balance methods and lower-order models for aerodynamic force calculation and transonic flutter prediction using SU2 and NASTRAN
- Funded by Bombardier Inc. under Singapore Aerospace Programme Cycle 16

Project Officer — **May 2021 - Aug 2022**
Supervisor: Prof. Wai Lee CHAN, Prof. Basman ELHADIDI
School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore
- Investigating Galilean invariance assumptions in LES and DNS of bluff-body flows
- Overset mass conservation and Galilean-invariant boundary treatments in OpenFOAM
- Funded by Ministry of Education Academic Research Fund Tier 1 Grant

Undergraduate Research Assistant **Dec 2017 - Jun 2021**

Supervisor: Prof. Daniel NEW

School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore

- Unsteady simulations of vortex-rings in confined cylindrical geometries using ANSYS Fluent
- Particle-image velocimetry of vortex-ring interactions with free surfaces and density interfaces
- Planar laser-induced fluorescence and colored dye flow visualizations of various vortex-rings

Undergraduate Research Assistant **May 2019 - Jun 2021**

Supervisor: Prof. Basman ELHADIDI

School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore

- Dynamic pitch response test in wind tunnel for aerodynamic analysis of VTOL UAVs
- Least-square regression models and system identification using MATLAB for stability analysis

Project Manager Intern **Sep 2020 - May 2021**

Supervisor: Prof. Wai Lee CHAN, Prof. Jean LEE

School of Humanities & Social Sciences, Nanyang Technological University, Singapore

- Statistical analysis for engineering communication skills pedagogical study
- Funded by Ministry of Education Tertiary Research Fund Grant

Research Intern **Jun 2020 - Aug 2020**

Center for Aerodynamics and Propulsion, Temasek Laboratories @ National University of Singapore

- LES for aerodynamic and aeroacoustic modelling of propeller blades using ANSYS Fluent

PUBLICATIONS & PRESENTATIONS

Journal Papers

- Yeo K.W.B., Ihme M. (2026). *Development of a mixed-precision discontinuous Galerkin framework for compressible flow calculations*. Accepted for publication in *AIAA SciTech Forum 2026*.
- Yeo K.W.B., Chan W.L., Elhadidi B. (2025). *Challenging the Galilean Invariance assumption in CFD*. Submitted to *Physical Review Fluids*, under review.
- New T.H., Yeo K.W.B., Koh J.Y., Long J. (2024). *Flow transitions of head-on vortex ring collisions with contaminated air-water interfaces*. Physics of Fluids 36(1):014112. doi:10.1063/5.0176897
- Yeo K.W.B., Koh J.Y., Long J., New T.H. (2020). *Flow transitions in collisions between vortex-rings and density interfaces*. Journal of Visualization 23:783-791. doi:10.1007/s12650-020-00666-7

Conference Presentations (Oral)

- Yeo K.W.B., Ihme M. (2024). *Development of a machine learning-enabled high-order discontinuous Galerkin solver for compressible flow simulations*. 77th Annual Meeting of the APS Division of Fluid Dynamics, Salt Lake City, UT, USA, 2024.

- Yeo K.W.B., Koh J.Y., Long J., New T.H. (2019). *Flow transitions in collisions between vortex-rings and density interfaces*. 15th Asian Symposium on Visualization, Busan, South Korea, 2019.
- Yeo K.W.B., Koh J.Y., Long J., New T.H. (2019). *Flow transitions in collisions between vortex-rings and free surfaces*. 17th European Turbulence Conference, Turin, Italy, 2019.

HONORS & AWARDS

2022 A*STAR National Science Scholarship (PhD)
2021 Professional Attachment Certificate of Distinction
2020 AY2019/20 Dean's List, School of Mechanical & Aerospace Engineering, NTU
Spring 2020 Dean's List & Semester Honors, Purdue University Aeronautics & Astronautics
CNYSP Research Award (Gold)
2019 Best Presentation Student Award, 15th Asian Symposium on Visualization
2017 Nanyang Scholarship (CN Yang Scholars Programme)
NTU College of Engineering (CoE) Dean's Award
Mechanical & Aerospace Engineering Enrichment Grant

ACADEMIC AFFILIATIONS

American Institute of Aeronautics & Astronautics (AIAA) Student Member — May 2025 - present
American Physical Society (APS) Student Member — Jun 2024 - present
International Forum for Aviation Research (IFAR) Early-Career Network — Jan 2023 - present
Agency for Science, Technology and Research, Singapore (A*STAR) — Aug 2022 - present

TEACHING & SERVICE

Teaching Assistant - Gas-Turbine Design Analysis, Stanford University **Sep 2025 - Dec 2025**
Responsibilities: Holding office hours, grading problem sets, designing coding tutorial

Scientists-in-Schools Program, Zhangde Primary School **Sep 2022 - Apr 2023**
Responsibilities: Developing lesson plan and coding demonstrations

Peer Instructor, CN Yang Scholars Club **Sep 2019 - Aug 2020**
Responsibilities: Designing extra instructional materials, preparing exam solutions, mentoring, tutoring

MISCELLANY

- Web design and development: FX Lab website , BLASTNet
- Aircraft design/build/fly: Weird Takeoff & Landing UAV , Mini Delivery Quadcopter
- Serial warranty voiding: Desktop PCs, mechanical keyboards

– References available on request.