Khanh Nguyen (He/Him)

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EDUCATION

Doctor of Philosophy, Smart Vehicle Engineering | **GPA: 4.00/4.00** (02/2022 – Expected 02/2026)
Konkuk University (Ku), Seoul, Republic of Korea
Courses: Robot Kinematics, Numerical Analysis, Optimal Control Theory, Elasticity

Master of Science, Smart Vehicle Engineering | **GPA: 3.89/4.00** (02/2019 – 02/2021)
Konkuk University (Ku), Seoul, Republic of Korea
Courses: Finite Element Method (FEM), Advanced FEM, Structural Dynamics, Microsystem

Bachelor of Engineering, Mechanical and Aerospace Engineering | **GPA: 3.18/4.00** (09/2013 – 08/2018)
Vietnam National University, University of Science and Technology, Ho Chi Minh (VNU – HCMUT)

- The five–year France Excellent Engineer Training Program in Vietnam (PFIEV), accredited by France's CTI, is awarded the EUR–ACE Master's label and comprises a total of 274 European credits (ECTS).

Courses: Aerodynamics, Aircraft Propulsion, Combustion, Computational Fluid Dynamics (CFD), Helicopters, Flight Mechanics.

RESEARCH EXPERIENCES

PH.D. PROGRAM, KONKUK UNIVERSITY, SEOUL, REPUBLIC OF KOREA

Project 1: Flapping-wing fast forward flight (ongoing)
Project 2: Design of a fast-swimming robot (ongoing)
Project 3: Flapping flights on Mars
01 first-authored paper published in 2024.

- Investigated stability characteristics of a flapping-wing hover under Martian atmospheric condition using ANSYS–Fluent.
- Studied aerodynamic characteristics of a flapping-wing robot during takeoff under varying ultra–low air densities using ANSYS-Fluent (ongoing).

Project 4: Leaping robotic fish
01 first-authored paper & **01** co-authored paper published in 2023.

- Conducted CFD simulation with ANSYS–Fluent to estimate body drag using measured undulatory swimming kinematics.
- Performed CFD analysis using ANSYS–Fluent to explore the feasibility of gliding in a flying–fish–liked robot. The robot achieves gliding after rapid swimming, leaping out of water, partially supported by submerged tail beating motion in combination with a pair of fixed wings.

M.S. PROGRAM, KONKUK UNIVERSITY, SEOUL, REPUBLIC OF KOREA

Project 1: Aerodynamic improvement
01 first-authored paper published in 2021.

- Numerically proposed an optimal wing kinematics (WK) that can improve aerodynamic performance of a flapping-wing hover by 31%. That proposed WK can maintain lift while reducing drag coefficients. The proposed modification includes distributed wing corrugation along the wingspan, adjusted wing motion, and exclusion of the clap–fling mechanism (2021).

Project 2: Stability of a flapping-wing robot
01 first-authored paper published in 2021.

- Conducted CFD simulation to compare the longitudinal and lateral stability characteristics of two flappers hovering using different stroke–plane–change and trailing–edge–change mechanisms (2021).

GRADUATE RESEARCH, VNU – UNIVERSITY OF SCIENCE AND TECHNOLOGY, HO CHI MINH

Project 1: **Aerodynamics of UAV–HOPE (fixed wings in forward flight)**
01 co-authored paper published in 2024.

- Investigated the aerodynamics of UAV–HOPE during forward flight using OpenFOAM, with a focus on the lift contribution of the fixed wings.
- Analyzed laminar purple separation and flow detachment along both the chordwise and spanwise positions.

Project 2: **Aerodynamics of UAV–HOPE (tricopter frame in forward flight)**
01 co-authored paper published in 2020.

- Co-supervised an aerodynamic investigation of the tricopter, considered as the principal frame structure for UAV–HOPE design, during forward flight using Virtual Blade Element implemented in OpenFOAM.
- Developed a program to predict a converged tip path plane angle in forward flight using input parameters such as mass, lift, and drag coefficients of the tricopter.

UNDERGRADUATE THESIS, VNU – UNIVERSITY OF SCIENCE AND TECHNOLOGY, HO CHI MINH

Thesis: **Aerodynamics of UAV–HOPE (tricopter frame during takeoff)**
01 international conference paper presented at Southeast Asia Workshop on Aerospace Engineering (Thailand, 2018).

- Modelled the geometric characteristics of a 3-rotor propulsion system using commercial rotor blade (PJP-T-L 12x4.5)

- Conducted numerical aerodynamic analyses of a tricopter frame propelled by three rotor blades during takeoff under varying inflow speeds of (0.1, 0.3, 2.0 and 6.0) m/s using the Virtual Blade Model in OpenFOAM.
- At the same speed of 6833 RPM, the CFD–based thrust using Blade Element Theory was 5% lower than the thrust specified by the manufacturer, while the prediction using Blade Element Momentum Theory showed a 12% deviation.

HONORS AND AWARDS

Doctoral Fellowship, KU, Republic of Korea (2022 – 2026).
Graduate Research Assistant, KU, Republic of Korea (2019 – 2021).
Research Assistant Fellowship, VNU – HCMUT, Vietnam (2018 – 2019).
Best Paper Award, 18th International Conference on Intelligent Unmanned Systems (ICIUS), Japan (2022).
Merits for Exceptional Academic Students, KU, Republic of Korea (50%, 2019 – 2021 & 2022 – 2024).
Excellent Student of VNU – HCMUT, Vietnam (120% tuition waiver in 2018).
Outstanding Scholar Tuition Grant, VNU – HCMUT, Vietnam (100% in 2014 and 110% in 2017).

PROFESSIONAL SERVICES

Journal reviewer, Journal of Aeronautics Astronautics and Aviation (JAAA, 2023 – 2024)
Journal reviewer, International Journal of Intelligent Unmanned Systems (IJIUS, 2021)
Conference reviewer, International Conference on Intelligent Unmanned Systems (ICIUS, 2021)

UNIVERSITY SERVICES

Teaching Assistant

Assisted in grading assignments (KU): Basics of mechanics (Fall, 2020), Finite Element Method (Spring, 2025).
Facilitated students understanding assignments during lectures (VNU – HCMUT): Fluid Mechanics (delivered in English, 2018).

Research Assistant

Co-supervised two students on their graduation theses (Doan Tran Kim Khanh & Nguyen Tien Nghi) in 2018 (VNU – HCMUT).

TECHNICAL SKILLS

- **Simulation and Post-Processing Tools**: ANSYS-Fluent, CFD-Post, OpenFOAM, ParaFoam
- **CAD and Development Tools**: SOLIDWORKS, AutoCAD, Visual Studio, VS Code
- **Software**: Microsoft Office, Adobe Photoshop, Adobe Media Encoder
- **Meshing Generators**: ANSYS-ICEM, Salome, snappyHexMesh
- **Image Processing**: Digitalizing Tool-DLTdv, pixel-based analysis
- **CNC Equipment & Milling Tools**: Mill, Match3Mill, CNC machine
- **3D Printing Technologies**: Cubicreator, 3D Printer
- **Molding Techniques**: Silicone Molding
- **Programming Languages**: MATLAB, C++, Python
- **Web Development**: HTML, CSS

JOURNAL ARTICLES

1. Le, THH, **Nguyen**, **K**, Vuong, THN, **2024**. Numerical analysis for aerodynamic characteristics of the unmanned aerial vehicle (UAV) in forward flight. Journal of Aeronautics, Astronautics and Aviation, 56, 1081, 2024 (Second author is the main contributor).
2. **Nguyen, K**, Ha, G, Kang, T, Park, HC, **2024**. Analysis of hovering flight stability of an insect-like flapping-wing robot in Martian condition. Aerospace Science and Technology, 152, 109371,
3. **Nguyen, K**, Park, HC, **2023**, Feasibility study on mimicking the tail-beating supported gliding flight of flying fish. Ocean Engineering, 287, 115745.
4. Pham, TH, **Nguyen**, **K**, Park, HC, **2023**. A robotic fish capable of fast underwater swimming and water leaping with high Froude number. Ocean Engineering, 268, 113512.
5. **Nguyen**, **K**, Au, LTK, Phan, HV, Park, HC, **2021**. Comparative dynamic flight stability of insect-inspired flapping-wing micro air vehicles in hover: Longitudinal and lateral motions. Aero. Scie. and Tech, 119, 107085.
6. **Nguyen**, **K**, Au, LTK, Phan, HV, Park, SH, Park, HC, **2021**. Effects of wing kinematics, corrugation, and clap-and-fling on aerodynamic efficiency of a hovering insect-inspired flapping-wing micro air vehicle. Aerospace Science and Technology, 118, 106990.
7. Tran, DKK, **Nguyen**, **K**, Le, THH, Nguyen, NH, **2020**. Numerical simulation for the forward flight of the tri-copter using virtual blade model. Journal of Advanced Research in Fluid Mechanics and Thermal Sciences, 67, 1, 1-32.