

# Khanh Nguyen (He/Him)

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## EDUCATION

### KONKUK UNIVERSITY (KU), SEOUL, REPUBLIC OF KOREA

2019 – Expected Feb 2026

*Doctor of Philosophy, Smart Vehicle Engineering (2022 – 2026) | GPA: 4.00/4.00*

Courses: Robot Kinematics, Numerical Analysis, Optimal Control Theory, Elasticity

*Master of Science, Smart Vehicle Engineering (2019 – 2021) | GPA: 3.89/4.00*

Courses: Finite Element Method (FEM), Advanced FEM, Structural Dynamics, Microsystem

### VIETNAM NATIONAL UNIVERSITY, HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY (VNU – HCMUT)

2013 – 2018

*Bachelor of Engineering, Mechanical and Aerospace Engineering | GPA: 3.18/4.00*

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 EXPERIENCE

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

**Project 1:** Flapping-wing robot in fast forward flight (ongoing collaboration with Prof.' Floreano's lab, EPFL)

- Conducted CFD simulation of a flapping wing motion under tethered, tilting conditions with varying inflow speeds from 2 to 4 m/s using a wind tunnel and high-speed camera to measure wing kinematics (WK).

**Project 2:** Design and fabrication of a fast-swimming robot (5-year ongoing project)

**01** first-authored paper after first year ([data complete, writing 90% finished, preparing for submission](#))

- Developed a fast-robotic fish capable of achieving a possible target swimming speed using physical parameters falling in reasonable ranges observed in biological and artificial fish.

**Project 3:** Flapping flights on Mars (ongoing)

**01** first-authored paper ([2024, JCR Q1, IF = 5.0](#)) & **01** first-authored paper ([data 90% finished, writing preparation](#)).

- 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 ([2023, JCR Q1, IF = 4.6](#)) & **01** co-authored paper ([2023, JCR Q1, IF = 4.6](#)).

- 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 ([2021, JCR Q1, IF = 5.0](#)).

- Numerically proposed an optimal 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 ([2021, JCR Q1, IF = 5.0](#)).

- 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 – HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY, VIETNAM

**Project 1:** Aerodynamics of UAV-HOPE (fixed wings in forward flight)

**01** co-authored paper ([2024, JCR Q3, IF = 0.9, main contributor](#))

- Investigated the aerodynamics of the UAV-HOPE's fixed wings during forward flight using OpenFOAM.
- 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 ([2020, SJR: Q3, IF = 0.3](#))

- 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 MATLAB 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 – HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY, VIETNAM

**Project:** Aerodynamics of UAV–HOPE (tricopter frame during takeoff) (Graduate thesis graded **9.07/10.0**)

**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

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Postdoctoral Fellowship, KU, Republic of Korea (Assigned by Prof. Park; Expected February 2026 – August 2027).

Doctoral Fellowship, KU, Republic of Korea (50% tuition and living expenses, 2022 – 2026).

Teaching Assistant Fellowship, KU, Republic of Korea (2023 – 2024).

Best Paper Award, Korean Society for Aeronautical and Space Sciences 2024 Fall Conference, Republic of Korea (2024).

Best Paper Award, 18th International Conference on Intelligent Unmanned Systems (ICIUS), Japan (2022).

Graduate Research Assistant, KU, Republic of Korea (50% tuition and living expenses, 2019 – 2021).

Merits for Exceptional Academic Students, KU, Republic of Korea (50% tuition, 2019 – 2021 & 2022 – 2024).

Research Assistant Fellowship, VNU – HCMUT, Vietnam (8 months, 2018).

Teaching Assistant Fellowship, VNU – HCMUT, Vietnam (2018).

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

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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

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### 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

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**Programming:** C++, HTML, CSS.

**Development Tools:** Visual Studio, VS Code.

**Meshing Generators:** ANSYS-ICEM, Salome, snappyHexMesh.

**Simulation and Post-Processing Tools:** ANSYS-Fluent, CFD-Post, OpenFOAM, ParaFoam.

**Manufacturing Tools:** Mill, Match3Mill, CNC Machine Tool, 3D Printing, Direct Linear Transformation Digitizing Tool.

**Software:** AutoCAD, ANSYS-Design Modeler, Adobe Photoshop, Cubicreator, MATLAB, MS Office, SolidWorks.

**Processes:** Silicone Mold Making, High Speed Camera Operation, Torque/Force Transducer Measurement, Image Processing.

## JOURNAL ARTICLES

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1. **Nguyen, K**, Ha, G, Park, HC. [Aerodynamic behaviors of flapping wings under varying low-density air conditions](#). *In progress*.
2. **Nguyen, K**, Park, HC. [A comprehensive design process for developing a tail-beat fast-swimming robot: scaling-based design approach](#). *In progress*.
3. 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, 1081, 2024 (Second author is the main contributor).
4. **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.
5. **Nguyen, K**, Park, HC, **2023**. [Feasibility study on mimicking the tail-beating supported gliding flight of flying fish](#). Ocean Engineering, 287, 115745.
6. 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.
7. **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](#). Aerospace Science and Technology, 119, 107085.
8. **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.
9. 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.

## CONFERENCE PAPERS

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1. **Nguyen, K**, Ha, G, Park, HC, [Design and demonstration of a high-speed aquatic swimmer using tail-beat propulsion](#), Int'l Conf. of Intelligent Unmanned System (ICIUS), Bali, Indonesia, Aug. 20-24, 2025. **(Presenter)**
2. Ha, G, **Nguyen, K**, Park, HC, [A study on the takeoff of an insect-like flapping-wing system under low air density and low gravity conditions](#), Proceedings of Korean Society for Aeronautical and Space Sciences (KSAS), Korea, Nov. 11, 2024. (Selected best paper award).
3. **Nguyen, K**, Ha, G, Park, HC, [Design and fabrication of high-thrust tail-beating mechanism for fish-inspired swimming robot](#), Int'l Conf. of Intelligent Unmanned System (ICIUS), Bandung, Indonesia, Aug. 20-24, 2024. **(Presenter)**
4. **Nguyen, K**, Park, HC, [Analytical and experimental performance verifications of a fast-swimming robotic fish](#), Int'l Conf. of Intelligent Unmanned System (ICIUS), Bandung, Indonesia, Aug. 20-24, 2024. **(Presenter)**
5. **Nguyen, K**, Kang, TS, Park, HC, [Hovering characteristics of an insect-like flapping-wing robot on Mars](#), Proceedings of Korean Society for Aeronautical and Space Sciences (KSAS), Korea, Nov. 16, 2023. **(Presenter)**
6. **Nguyen, K**, Ha, G, Park, HC, [Preliminary design of a fish-like fast robot by scaling of the KUFish](#), Int'l Conf. of Intelligent Unmanned System (ICIUS), Adelaide, Australia, July 5-7, 2023.
7. **Nguyen, K**, Park, HC, [Roles of hydrodynamic forces generated by tail-beating motion in gliding flight of flying-fish-mimicking robot](#), Int'l Conf. of Intelligent Unmanned System (ICIUS), Adelaide, Australia, July 5-7, 2023. **(Presenter)**
8. Ha, G, **Nguyen, K**, Park, HC, [Thrust generation by flapping-wings under the low-air density condition](#), Int'l Conf. of Intelligent Unmanned System (ICIUS), Adelaide, Australia, July 5-7, 2023.
9. Le, THH, **Nguyen, K**, Tran, MH, [Numerical analysis for aerodynamic characteristics of the unmanned aerial vehicle \(UAV\) in forward flight](#), Southeast Asia Workshop on Aerospace Engineering (SAWAE), Thailand, 2023.
10. **Nguyen, K**, Pham, TH, Park, HC, [Numerical investigation of hydrodynamics for a fish-like robot under undulatory forward swimming](#), Proceedings of the Korean Society of Mechanical Engineers Annual Meeting, Jeju, Korea, 2022. **(Presenter)**
11. Ha, G, **Nguyen, K**, Park, HC, [Prediction of flapping wing characteristics in ultra-low air-density condition using a dynamic model](#), Int'l Conf. of Intelligent Unmanned System (ICIUS), Tokushima, Japan, Aug. 9-12, 2022.
12. Pham, TH, **Nguyen, K**, Park, HC, [Leaping out of water of the KUFish: Prediction and demonstration](#), ICIUS, Tokushima, Japan, Aug. 9-12, 2022. (Selected best paper award)
13. **Nguyen, K**, Pham, TH, Park, HC, [Numerical estimation of hydrodynamic thrust using the measured tail-beating kinematics of a fish-like robot](#), ICIUS, Tokushima, Japan, Aug. 9-12, 2022. **(Presenter)**
14. **Nguyen, K**, Au, LTK, Phan, Hoang Vu, Park, HC, [Wing kinematics modulation in an insect-like tailless flapping wing micro air vehicle \(FW-MAV\) for higher aerodynamic efficiency](#), ICIUS, Vietnam, Aug. 25-27, 2021. **(Presenter)**
15. Dao, T.T, **Nguyen, K**, Park, HC, [CFD and FSI-based parametric study on tail fin for high-speed underwater locomotion](#), ICIUS, Vietnam, Aug. 25-27, 2021.
16. **Nguyen, K**, Au, LTK, Park, HC, [Three-dimensional wing kinematics for improved aerodynamic performance of insect-like flapping-wing micro air vehicle](#), KSAS, Korea, 2020. **(Presenter)**
17. Au, LTK, **Nguyen, K**, Park, HC, [Effect of wing corrugation on aerodynamic performance in 3D flapping wings](#), Proceedings of Korean Society for Aeronautical and Space Sciences (KSAS), Korea, 2019. **(Presenter)**
18. Tran, DKK, **Nguyen, K**, Le, THH, [Numerical simulation for the forward flight of the tri-copter using Virtual Blade Model](#), Southeast Asia workshop on Aerospace Engineering (SAWAE), Malaysia, 2019.
19. **Nguyen, K**, Nguyen, NH, Le, THH, [Numerical approach for the vertical take-off and landing UAVs using the virtual blade model](#), Southeast Asia workshop on Aerospace Engineering (SAWAE), Thailand, 2018. **(Presenter)**