# Khanh Nguyen (He/Him)

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## EDUCATION

**KONKUK UNIVERSITY (KU), SEOUL, REPUBLIC OF KOREA**
*Doctor of Philosophy, Smart Vehicle Engineering* (2022 – Expected Feb 2026)
- GPA: 4.00/4.00
*Master of Science, Smart Vehicle Engineering* (2019 – 2021)
- GPA: 3.89/4.00

**VIETNAM NATIONAL UNIVERSITY, HCM CITY UNIVERSITY OF TECHNOLOGY (VNU–HCMUT), HCM, VIETNAM**
*Bachelor of Engineering, Mechanical and Aerospace Engineering* (2013 – 2018)
- GPA: 3.18/4.00
- The Vietnam-France Excellent Engineer Training Program (PFIEV) is accredited by France's Engineering Degree Commission (Commission des Titres d'Ingénieur – CTI, 2004 – 2022) and designated as a *EUR – ACE* Master Program by the European Network for Accreditation of Engineering Education (ENAEE, 2010 – 2022).
- This five-year training program offers a high-quality engineering education, comprising 274 European credits.

## RESEARCH EXPERIENCE

**PH.D. PROGRAM, KONKUK UNIVERSITY, SEOUL, REPUBLIC OF KOREA**
*Project 1: Flapping-wing (FW) robot in fast forward flight (ongoing)*
01 *co-authored* paper (Expected, ongoing collaboration with Prof. Dario Floreano's lab, EPFL, Switzerland)
- Conducted CFD simulation of a flapping wing motion under tethered, stroke-plane tilting conditions with inflow speeds from 2 to 4 m/s, using a wind tunnel.

*Project 2: Development of a biomimetic underwater robot platform (5-year ongoing project)*
01 *first-authored* paper after the first year (Manuscript completed and ready for profesional English review services)
- Developed a fast-swimming robotic fish capable of achieving a designed speed of 1.79 m/s based on physical parameters of reduced frequency, Froude number, and Strouhal number within ranges observed in both real and artificial fish, making it top 6 fastest recorded tail-beating robotic fish.

*Project 3: Flapping flights on Mars (ongoing)*
01 *co-authored* paper (Data 80% finished)
02 *first-authored* papers:
  - 1st paper: Published in 2024, JCR Q1, IF = 5.0 (Link)
  - 2nd paper: Data 90% completed.
- Investigated stability characteristics of a FW hover under Martian atmospheric conditions by CFD simulations.
- Studied aerodynamics of a FW robot during takeoff under low air densities using CFD simulations (ongoing).

*Project 4: Leaping robotic fish*
01 *first-authored* paper: 2023, JCR Q1, IF = 4.6 (Link)
01 *co-authored* paper: 2023, JCR Q1, IF = 4.6 (Link)
- Conducted CFD simulations to estimate body drag using measured undulatory swimming kinematics.
- Performed CFD analyses to explore the feasibility of gliding in a flying–fish–liked robot utilizing submerged tail beating and fixed wings after fast swimming underwater and leaping from water.

**M.S. PROGRAM, KONKUK UNIVERSITY, SEOUL, REPUBLIC OF KOREA**
*Project 1: Aerodynamic improvement (Graduate thesis grade: 95/100)*
01 *first-authored* paper: 2021, JCR Q1, IF = 5.0 (Link)
- Numerically proposed an optimal wing kinematics (WK) to improve aerodynamic performance of a flapping-wing hover by 31%, maintaining lift and reducing drag.
- Modifications include distributed spanwise wing corrugation, adjusted wing motion, and exclusion of the clap–fling mechanism.

*Project 2: Stability of a flapping-wing robot*
01 *first-authored* paper: 2021, JCR Q1, IF = 5.0 (Link)
- 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.

**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: original draft, revisions, review and editing (Link)
- 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 (Link)
- Co-supervised an aerodynamic investigation of the tricopter, the main UAV–HOPE frame, during forward flight using Virtual Blade Method (VBM) in OpenFOAM.

- Developed an iterative MATLAB program to predict a tip path plane angle in forward flight using inputs of mass, lift, and drag coefficients computed by CFD.

**B.E. PROGRAM, VNU – HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY, VIETNAM**
*Project: Aerodynamics of UAV–HOPE: tricopter frame during takeoff (Thesis grade: 9.07/10.0)*
01 conference paper presented at Southeast Asia Workshop on Aerospace Engineering (SAWAE, Thailand, 2018).
- Modelled the geometric characteristics of a 3-rotor propulsion system in OpenFOAM.
- Performed CFD analysis of tricopter taking off under the speeds of 0.1–6.0 m/s using VBM method.
- At 6833 RPM, the CFD thrust deviated by 5% from manufacturer data, while the calculated thrust by Blade Element Momentum Theory showed a 12% difference.

## HONORS AND AWARDS

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| Postdoctoral Fellowship, KU, Republic of Korea (ROK) (Verbally awarded) | Feb 2026 – Aug 2027 |
| Doctoral Fellowship, KU, ROK (living cost + 50% tuition fee) | 2022 – 2026 |
| Teaching Assistant Fellowship, KU, ROK | 2023 – 2024 |
| Best Paper Award, Korea Society for Aeronautical and Space Sciences Conference (ROK, KSAS) | Fall, 2024 |
| Best Paper Award, International Conference on Intelligent Unmanned Systems (Japan, ICIUS) | 2022 |
| Language Proficiency Award upon Admission to Ph.D. program, KU, ROK (50% tuition fee) | Spring, 2022 |
| Graduate Research Assistant, KU, ROK (living cost + 50% tuition fee) | 2019 – 2021 |
| Graduate Research Assistant, University of Ulsan, ROK (declined) | 2019 |
| Merit Award for Academic Achievement, KU, ROK (50% tuition fee) | Fall, 2019 – 2021 & Fall, 2022 – 2024 |
| Term-Time Research Fellowship, VNU – HCMUT, Vietnam | 8 months, 2018 |
| Teaching Assistant Fellowship, VNU – HCMUT, Vietnam | Spring, 2018 |
| Excellent Student of VNU – HCMUT, Vietnam (150% tuition fee) | Spring, 2018 |
| Merits for Quintessential Student, VNU – HCMUT, Vietnam (125% tuition fee) | Fall, 2014 & 2017 |

## PROFESSIONAL SERVICES

Journal Reviewer, Ocean Engineering (invited in 2024).
Journal Reviewer, Journal of Aeronautics Astronautics and Aviation (2023, 2024).
Journal Reviewer, International Journal of Intelligent Unmanned Systems (2021).
Conference Reviewer, International Conference on Intelligent Unmanned Systems (2021).

## UNIVERSITY SERVICES

**Teaching Assistant**
Assisted in grading assignments (KU): Basics of mechanics (Fall, 2020), Finite Element Method (Spring, 2025).
Facilitated students understanding assignments (VNU – HCMUT): Fluid Mechanics (delivered in English, 2018).
**Research Assistant**
Provided co-supervision for two students on graduation theses (Tran DKK, Nguyen TN) (VNU – HCMUT, 2018).

## TECHNICAL SKILLS

**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, Transducer Measurement, Image Processing.

## JOURNAL ARTICLES

1. **Nguyen K**, Ha G, Park HC. Aerodynamics of flapping wings under 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. Numerical analysis for aerodynamic characteristics of the unmanned aerial vehicle (UAV) in forward flight. Journal of Aeronautics, Astronautics and Aviation 1081 **2024** (*2nd author is the main contributor*).
4. **Nguyen K**, Ha G, Kang T, Park HC. Analysis of hovering flight stability of an insect-like flapping-wing robot in Martian condition. Aerospace Science and Technology (Aerosp. Sci. Tech.) 152 109371 **2024**.
5. **Nguyen K**, Park HC. Feasibility study on mimicking the tail-beating supported gliding flight of flying fish. Ocean Engineering 287 115745 **2023**.
6. Pham TH, **Nguyen K**, Park HC. A robotic fish capable of fast underwater swimming and water leaping with high Froude number. Ocean Engineering 268 113512 **2023**.
7. **Nguyen K**, Au LTK, Phan HV, Park HC. Comparative dynamic flight stability of insect-inspired flapping-wing micro air vehicles in hover: Longitudinal and lateral motions. Aerosp. Sci. Tech. 119 107085 **2021**.

8. **Nguyen K,** Au LTK, Phan HV, Park SH, Park HC. Effects of wing kinematics, corrugation, and clap-and-fling on aerodynamic efficiency of a hovering insect-inspired flapping-wing micro air vehicle. Aerosp. Sci. Tech. 118 106990 **2021**.
9. Tran DKK, **Nguyen K**, Le THH, Nguyen NH. 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 **2020**.

## CONFERENCE PAPERS

1. **Nguyen K**, Ha G, Park HC, Design and demonstration of a high-speed aquatic swimmer using tail-beat propulsion, ICIUS, Indonesia, 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 KSAS, Korea, 2024. (Best paper award).
3. **Nguyen K**, Ha G, Park HC, Design and fabrication of high-thrust tail-beating mechanism for fish-inspired swimming robot, ICIUS, Indonesia, 2024. **(Presenter)**
4. **Nguyen K**, Park HC, Analytical and experimental performance verifications of a fast-swimming robotic fish, ICIUS, Indonesia, 2024. **(Presenter)**
5. **Nguyen K**, Kang, TS, Park HC, Hovering characteristics of an insect-like flapping-wing robot on Mars, Proceedings of KSAS, Korea, 2023. **(Presenter)**
6. **Nguyen K**, Ha G, Park HC, Preliminary design of a fish-like fast robot by scaling of the KUFish, ICIUS, Australia, 2023.
7. **Nguyen K**, Park HC, Roles of hydrodynamic forces generated by tail-beating motion in gliding flight of flying-fish-mimicking robot, ICIUS, Adelaide, Australia, 2023. **(Presenter)**
8. Ha G, **Nguyen K**, Park HC, Thrust generation by flapping-wings under the low-air density condition, ICIUS, Australia, 2023.
9. Le THH, **Nguyen K**, Tran MH, Numerical analysis for aerodynamic characteristics of the unmanned aerial vehicle (UAV) in forward flight, 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. Pham TH, **Nguyen K,** Park HC, Leaping out of water of the KUFish: Prediction and demonstration, ICIUS, Japan, 2022. (Best paper award).
12. **Nguyen K,** Pham TH, Park HC, Numerical estimation of hydrodynamic thrust using the measured tail-beating kinematics of a fish-like robot, ICIUS, Japan, 2022. **(Presenter)**
13. **Nguyen K,** Au LTK, Phan HV, Park HC, Wing kinematics modulation in an insect-like tailless flapping wing micro air vehicle (FW-MAV) for higher aerodynamic efficiency, ICIUS, Vietnam, 2021. **(Presenter)**
14. **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)**
15. Tran, DKK, **Nguyen K**, Le THH, Numerical simulation for the forward flight of the tri-copter using Virtual Blade Model, SAWAE, Malaysia, 2019.
16. **Nguyen K,** Nguyen NH, Le THH, Numerical approach for the vertical take-off and landing UAVs using the virtual blade model, SAWAE, Thailand, 2018. **(Presenter)**

## REFERENCES

**Park, Hoon Cheol, Ph.D**.
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Department of Smart Vehicle Engineering
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**Le, Thi-Hong-Hieu, Ph.D.**
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