

# Khanh Nguyen (He/Him)

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## EDUCATION

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

*Doctor of Philosophy, Smart Vehicle Engineering (2022 – Expected Feb 2026)*

- GPA: 4.00/4.00
- Thesis title (tentative): *Exploring Bio-inspired Robotics: From Simulations of Flying-Fish-Like and Martian Flapping-Wing Robots to Fabrication of Fast-Swimming Robotic Fish.*

*Master of Science, Smart Vehicle Engineering (2019 – 2021)*

- GPA: 3.88/4.00 – Graduate thesis grade: 95/100
- Thesis title: *Investigation of stability and aerodynamic performance of a flapping-wing micro air vehicle in hover using 3D computational fluid dynamics (CFD) analyses.*

### 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 – Graduate thesis grade: 9.07/10
- Thesis title: *Computational Approach on the Aerodynamics of UAV combining fixed wing and three propellers.*
- The most prestigious and talented 5-year French – Vietnamese Training Program for Excellent Engineers (PFIEV) is accredited by France's Engineering Degree Commission (2004 – 2022) and designated as a EUR – ACE Master Program by the European Network for Accreditation of Engineering Education (ENAE, 2010 – 2022).
- This program offers a high-quality engineering education, comprising 274 European Credits (ECTS).

## RESEARCH EXPERIENCE

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### PH.D. PROGRAM, KU, SEOUL, REPUBLIC OF KOREA

#### **Project-2024: Flapping-wing micro air vehicle (FW-MAV) in fast forward flight**

*Ongoing collaboration with Prof. Dario Floreano's lab, EPFL, Switzerland*

**Expected 01 co-authored paper (kinematics measurement in progress)**

- Performing CFD simulations using the measured wing kinematics of the FW robot under tethered, stroke-plane tilting conditions with inflow varying at speeds of 2 to 4 m/s by a wind tunnel.

#### **Project-2024 (Invited): Out-of-plane motion and aerodynamics of hummingbird-like FW-MAV**

*Short-term collaboration with Prof. Dirk Vandeputte's lab, KU Leuven, Belgium*

**Expected 01 co-authored paper (Manuscript circulated for internal feedback)**

- Co-advised CFD simulations to analyze the wing deviation effects on hummingbird-like FW aerodynamics.

#### **Project-2022: Development of a biomimetic underwater robot platform (5-year ongoing project)**

**Expected 01 first-authored paper (Manuscript submitted for the professional English language review & editing)**

- Developed a robotic fish that can reach a target swimming speed of 1.79 m/s (5.6 BL/s) at 12.2 Hz using a complete design approach, ranking it among the top-speed and most efficient tail-beating robotic fishes.

#### **Project-2021: Flapping flights on Mars**

**01 first-authored paper: 2024, JCR Q1, IF = 5.0 ([Link](#))**

- Numerically investigated stability characteristics of a FW hovering under Martian atmospheric conditions.

**Expected 01 first-authored paper (data 90% completed)**

- Studied aerodynamics of a FW robot during takeoff under low air densities using CFD simulations.

**Expected 01 co-authored paper (data 80% completed)**

- Performed simulations to support conclusions of aerodynamics under one-digit percentage density condition.

#### **Project-2020: Leaping robotic fish**

**01 first-authored paper: 2023, JCR Q1, IF = 4.6 ([Link](#))**

- Performed CFD simulations to analyze the feasibility of gliding in a flying-fish-like robot after leaping from water.

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

- Conducted CFD simulations to estimate body drag using measured undulatory swimming kinematics.

### M.S. PROGRAM, KU, SEOUL, REPUBLIC OF KOREA

#### **Project-2020: Aerodynamic improvement of a hovering FW-MAV**

**01 first-authored paper: 2021, JCR Q1, IF = 5.0 ([Link](#))**

- Numerically proposed an optimal wing kinematics to improve aerodynamic efficiency by 31%.
- Modifications include spanwise corrugation, adjusted wing rotation angles, and exclusion of clap-fling mechanism.

#### **Project-2019: Comparative stability analyses of FW-MAVs**

**01 first-authored paper: 2021, JCR Q1, IF = 5.0 ([Link](#))**

- Performed CFD simulation to compare the longitudinal and lateral stability characteristics of 2 hovering flappers.

### GRADUATE RESEARCH, VNU – HCMUT, HO CHI MINH, VIETNAM (VN)

#### **Project-2018: Aerodynamics of UAV-HOPE: fixed wings in forward flight**

01 co-authored paper: 2024, JCR Q3, IF = 0.9 ([Link](#). Main contributor: Original draft, editing & revisions).

- 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-2018: Aerodynamics of UAV-HOPE: tricopter frame in forward flight**

01 co-authored paper: 2020, SJR: Q3, IF = 0.3 ([Link](#))

- Co-advised a study on tricopter's forward-flight aerodynamics using Virtual Blade Method (VBM) in OpenFOAM.
- Developed an iterative MATLAB program to predict a tip path plane angle in forward flight.

## **B.E. PROGRAM, VNU – HCMUT, HO CHI MINH, VIETNAM**

### **Thesis-2018: Aerodynamics of UAV-HOPE: tricopter frame during takeoff**

01 conference paper: presented at Southeast Asia Workshop on Aerospace Engineering (SAWAE, Thailand, 2018).

- Performed CFD analysis of tricopter taking off at speeds of 0.1–6.0 m/s using VBM method in OpenFOAM.
- The rotor thrust by CFD was 5% different from the manufacturer data, while the computed one by blade element momentum theory (BEMT) showed a difference of 12%.

## **HONORS AND AWARDS**

Postdoctoral Fellowship, KU (Awarded)	2026 – 2027
Doctoral Fellowship, KU ( <a href="#">living cost + 50% tuition</a> )	2022 – 2026
Best Paper Award, Korea Society for Aeronautical and Space Sciences Conference (KSAS)	2024
Best Paper Award, International Conference on Intelligent Unmanned Systems (ICIUS)	2022
Language Proficiency Award upon Ph.D. Admission ( <a href="#">50% tuition</a> ), KU	2022
Merits for Academic Achievement ( <a href="#">50% tuition</a> ), KU	2019 – 2021, 2022 – 2024
Graduate Research Assistant, KU ( <a href="#">living cost + 50% tuition</a> )	2019 – 2021
Graduate Research Assistant, University of Ulsan, Republic of Korea (Declined)	2019
Research Fellowship, HCMUT	Apr-Dec, 2018
Teaching Assistant Fellowship, at HCMUT and KU	2018, 2024
Excellent Student of HCMUT ( <a href="#">150% tuition</a> )	2018
Merits for Quintessential Student, HCMUT ( <a href="#">125% tuition</a> )	2014, 2017
Top Admission Scorers of Faculty of Aerospace Engineering & Qualification for PFIEV Program, HCMUT	2013
Quintessential Student in the National University Entrance Exam at Tran Phu High School (HCM)	
Top 1% Nationwide in the Vietnam National University Entrance Exam. Total score: 25/30 ( <a href="#">Link</a> )	

## **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 for Basics of Mechanics (Fall, 2020) & Finite Element Method (Spring, 2025) at KU.

Facilitated students in solving and explaining Fluid Mechanics assignments (in English) at VNU – HCMUT (2018).

### **Research Assistant**

Co-advised student research projects with Dr. Le, funded by VNU – HCMUT (2025).

Co-advised master students from Prof. Kang's Lab on CFD work and mechanical design in robot fish project (2025).

Advised CFD work and reviewed manuscript on the FW simulations in collaboration with the KU Leuven team (2025).

Co-advised 02 undergraduate junior students on their graduation theses at VNU – HCMUT (2018).

## **TECHNICAL SKILLS**

**Programming Languages:** MATLAB, 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.

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

**Software:** AutoCAD, Adobe Photoshop, Cubicreator, MS Office, SolidWorks.

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

## **JOURNAL ARTICLES**

1. Roelandt T, **Nguyen K**, Park HC, Vanierschot M, Vandepitte D. [Out-of-plane wing motion effects on aerodynamic performance of a hummingbird-like flapping wing. Internal circulation for feedback.](#)
2. **Nguyen K**, Ha G, Park HC. [Aerodynamics of flapping wings under low-density air conditions. In progress.](#)
3. **Nguyen K**, Park HC. [A comprehensive design process for developing a tail-beat fast-swimming robot: scaling-based design approach. Submitted for professional English language review and editing.](#)

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4. Le THH, **Nguyen K**, Vuong THN. [Numerical analysis for aerodynamic characteristics of the unmanned aerial vehicle \(UAV\) in forward flight](#). J. Aeronaut. Astronaut. Aviat. 1081 **2024** (JCR, Q3, IF = 0.9, main contributor).
  5. **Nguyen K**, Ha G, Kang T, Park HC. [Analysis of hovering flight stability of an insect-like flapping-wing robot in Martian condition](#). Aerosp. Sci. Technol. 152 109371 **2024**. (JCR, Q1, IF = 5.0)
  6. **Nguyen K**, Park HC, [Feasibility study on mimicking the tail-beating supported gliding flight of flying fish](#). Ocean Eng. 287 115745 **2023**. (JCR, Q1, IF = 4.6)
  7. Pham TH, **Nguyen K**, Park HC. [A robotic fish capable of fast underwater swimming and water leaping with high Froude number](#). Ocean Eng. 268 113512 **2023**. (JCR, Q1, IF = 4.6)
  8. **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**. (JCR, Q1, IF = 5.0)
  9. **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. Technol. 118 106990 **2021**. (JCR, Q1, IF = 5.0)
  10. Tran DKK, **Nguyen K**, Le THH, Nguyen NH. [Numerical simulation for the forward flight of the tri-copter using virtual blade model](#). J. Adv. Res. Fluid Mech. Therm. Sci. 67 1 1-32 **2020**. (SJR, Q3, IF = 0.3)

## 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](#), 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, AU, 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. Le THH, **Nguyen K**, Tran MH, [Numerical analysis for aerodynamic characteristics of the unmanned aerial vehicle \(UAV\) in forward flight](#), SAWAE, Thailand, 2023.
9. **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)
10. Pham TH, **Nguyen K**, Park HC, [Leaping out of water of the KUFish: Prediction and demonstration](#), ICIUS, Japan, 2022. (Best paper award).
11. **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)
12. **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)
13. **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)
14. Tran, DKK, **Nguyen K**, Le THH, [Numerical simulation for the forward flight of the tri-copter using Virtual Blade Model](#), SAWAE, Malaysia, 2019.
15. **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

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| <b>Park, Hoon Cheol, Ph.D.</b><br>Full Professor, Director of<br>Laboratory of Bioinspired System<br>Department of Smart Vehicle<br>Engineering<br>Konkuk University, RoK<br>hcpark@konkuk.ac.kr | <b>Le, Thi-Hong-Hieu, Ph.D.</b><br>Senior Lecturer, Dean, and Coordinator of<br>PFIEV Program<br>Department of Aerospace Engineering<br>Vietnam National University, Ho Chi Minh<br>City University of Technology, Vietnam<br>+84 902 166 271<br>honghieu.le@hcmut.edu.vn | <b>Phan, Hoang-Vu, Ph.D.</b><br>Postdoctoral Researcher of<br>Laboratory of Intelligent Systems<br>École Polytechnique Fédérale de<br>Lausanne (EPFL), Switzerland<br>vu.phan@epfl.ch |
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