



# HUYNH NGUYEN NGOC

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Ho Chi Minh City, Vietnam

## PROFESSIONAL SUMMARY

A Ph.D. researcher in Computer Vision at Chonnam National University. My work focuses on low-light, underwater, and camouflaged object detection, where visual degradation makes conventional models unreliable. I develop enhanced deep learning architectures that combine Retinex-based illumination correction, attention mechanisms, and specialized loss functions to achieve sharper boundaries and more stable detection. In parallel, I study fish tracking and measurement for intelligent aquaculture, aiming to improve farm automation and animal monitoring. I am motivated by building AI systems that remain robust in real-world, low-visibility conditions. Ultimately, my research seeks to bridge advanced computer vision techniques with practical applications in smart and sustainable aquaculture systems.

## EDUCATION

### • University of Science - VNUHCM

- Bachelor of Science in Mathematics* 2014 - 2019  
Ho Chi Minh, Vietnam
- Faculty of Mathematics and Computer Science
  - Degree classification: Good

### • Chonnam National University

- Master in Science* 2021 - 2023  
Gwangju, South Korea
- Department of Artificial Intelligence Convergence
  - Thesis: **Artificial Intelligence of Things in Indoor Aquaculture: Development of a Light-Emitting Grid Panel for the Measurement of Fish Size from Images**

### • Chonnam National University

- PhD Candidate* 2023 - Present  
Gwangju, South Korea
- Department of Artificial Intelligence Convergence
  - GPA: 4.32

## PROFESSIONAL EXPERIENCE

### • Tan Tao University, Tay Ninh Province, Ho Chi Minh City

03/2020 - 07/2020

- Teaching Assistant*
- Assist the Professor in maintaining course operations. Encourage consistent attendance and engagement of students, maintain regular communication with students, and provide support when students encounter academic challenges. Develop homework assignments and provide code review and debugging assistance.

### • Soongsil University, Seoul, South Korea

09/2020 - 04/2021

- Research intern*
- AI research for community education.

### • Chonnam National University

09/2021 - Present

- Researcher - Main topic: Computer vision*
- My research with fish length and size estimation in indoor aquaculture systems, where I proposed a light-emitting grid panel beneath the tank to convert pixel measurements into real-world dimensions. Although effective in controlled environments, this approach is limited in practical aquaculture settings.
  - To address real-world conditions such as turbid water and low image quality, I shifted my focus to Retinex-based image decomposition for underwater enhancement (under submission). This line of work further led me to investigate camouflaged object detection, motivated by the strong camouflage characteristics of fish in natural environments.

## SKILLS

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- **Programming Languages:** Python, R, C, C++, MATLAB, L<sup>A</sup>T<sub>E</sub>X
- **Technologies:** Deep learning frameworks (PyTorch, Keras), YOLO families, Explainable AI, LLM Frameworks.
- **Web and Database Systems:** HTML 5, PHP, SQL, MySQL
- **Research & Analysis:** AI & Machine Learning Research, Data Processing, Error Analysis, Model Validation, Scientific Writing, Problem Solving.
- **Language:** English

## PATENTS AND PUBLICATIONS

J=JOURNAL, C=CONFERENCE

- [J.1] Nguyen-Ngoc Huynh, Choonsung Shin, Sunghee Hong, Hieyong Jeong (2025). **Cyber physical solutions for aquatic monitoring using YOLO with BCP loss for intelligent underwater camouflaged object detection.** *Scientific Reports*, Vol. 15, Article 41214. DOI: s41598-025-25090-5.
- [J.2] Nguyen-Ngoc Huynh, Hang Thi Phuong Nguyen, Myoungjae Jun, Choonsung Shin, Hieyong Jeong (2024). **Effect of Light-Emitting Grid Panel on Indoor Aquaculture for Measuring Fish Growth.** *Sensors*, Vol. 24, Article 852.
- [J.3] Hang Thi Phuong Nguyen, Yeongju Woo, Nguyen-Ngoc Huynh, Hieyong Jeong. (2022). **Scoring of Human Body-Balance Ability on Wobble Board Based on the Geometric Solution.** *Applied Sciences*, Vol. 12, Article 5967.
- [C.1] Nguyen-Ngoc Huynh, Hang Thi Phuong Nguyen, Myoungjae Jun, Choonsung Shin, Hieyong Jeong (2023). **Preliminary Study on Fish Tracking in Indoor Aquaculture through Deep Learning.** *Proceedings of the 29th International Workshop on Frontiers of Computer Vision (FCV 2023)*.
- [C.2] Nguyen-Ngoc Huynh, Hang Thi Phuong Nguyen, Myoungjae Jun, Choonsung Shin, Hieyong Jeong (2022). **Consideration of Software Approach for Fish Tracking.** *The 14th International Conference on Internet (ICONI 2022)*.

## HONORS AND AWARDS

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- **Industry-Academy Collaborative Artificial Intelligence (Bronze award).** Chonnam Nation University 2025
- **AI Agent Hackathon (Bronze award).** Chonnam National University 2025
- **Chonnam National University's Next Generation Academic Development Scholarship.** 2023 - 2025
- **Brain Korea 21 Scholarship (BK21).** 2021 - Present