BUI BACH THUAN

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EDUCATION

Doctor of Engineering | *Information Science and Engineering* | *GPA 5.0/5.0*   Oct. 2022 – Now
Ritsumeikan University   Osaka, Japan

Master of Engineering | *Information Science and Engineering* | *GPA 4.67/5.0*   Oct. 2020 – Sep 2022
Ritsumeikan University   Shiga, Japan

Bachelor of Engineering | *Telecommunications Engineering*   Sep. 2015 – Sep 2019
Hanoi University of Science and Engineering   Hanoi, Vietnam

RESEARCH BACKGROUND

Proficient in Computer Vision, Machine Learning, Visual Localization, Visual SLAM, and Evolutionary Algorithms. I gained approximately one year of industry experience developing AI algorithms for face detection and recognition before joining AIS Lab to pursue research on camera re-localization and mapping with machine learning (ML) techniques. During the first two years of my PhD, I developed multiple ML-based localization algorithms that accelerated camera-based localization by up to 700 times faster than traditional methods. Additionally, I authored the pioneering paper that applied ML (Transformer-based) to represent 3D maps with points and lines. My research has been published in leading robotics venues, including IROS, RA-L, and ISPRS (IF 11).

WORK EXPERIENCE

Research Intern - Remote   August 2024 – Now
Coolant   San Francisco, USA
- Enhancing Structure from Motion for Aerial Forestry Images
- Guiding Image Matching by Edge Features
- Modeling 3D Aerial Forestry Images using Gaussian Splatting

Research Assistant   June 2021 – Now
Advanced Intelligent System Laboratory   Shiga, Japan
- Developed a back-end API for data collection on cars
- Analyzed collected data and proposed a recommendation system based on driver behavior

AI Algorithm Engineer   November 2019 – April 2020
VTI Corporation   Hanoi, Vietnam
- Member of AI algorithms team, working on face recognition using deep learning

Laboratory Assistant   Oct. 2017 – Oct. 2019
Communications Research and Development Laboratory   Hanoi, Vietnam
- Led a group of undergrad. students for researching evolutionary algorithms on antenna design

SELECTED PUBLICATIONS

1. Bach-Thuan Bui, Huy-Hoang Bui, Dinh-Tuan Tran, and Joo-Ho Lee
   Focused mode for 3D points and lines mapping regression. Submitted to IEEE International Conference on Robotics and Automation (ICRA), 2025. (Under Review)

2. Huy-Hoang Bui, <u>Bach-Thuan Bui</u>, Dinh-Tuan Tran, and Joo-Ho Lee
Leveraging Neural Radiance Field in Descriptor Synthesis for Keypoints Scene Coordinate Regression. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024. [Paper | Website | Code]

3. <u>Bach-Thuan Bui</u>, Huy-Hoang Bui, Dinh-Tuan Tran, and Joo-Ho Lee
Representing 3D sparse map points and lines for camera relocalization. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024. [Paper | Website | Code | LinkedIn]

4. <u>Bach-Thuan Bui</u>, Dinh-Tuan Tran, and Joo-Ho Lee
D2S: Representing local descriptors and global scene coordinates for camera relocalization. IEEE Robotics and Automation Letters (RA-L), 2024. [Paper | Website | Code]

5. <u>Bach-Thuan Bui</u>, Dinh-Tuan Tran, and Joo-Ho Lee
Fast and Lightweight Scene Regressor for Camera Relocalization. 16th IEEE/SICE International Symposium on System Integration (SII), 2023. [Paper | Code]

6. <u>Bach-Thuan Bui</u>, Dinh-Tuan Tran, and Joo-Ho Lee
FeatLoc: Absolute pose regressor for indoor 2D sparse features with simplistic view synthesizing. ISPRS Journal of Photogrammetry and Remote Sensing, 2022 (IF 11.7). [Paper | Code]

OPEN SOURCE PROJECT

1. PL2Map (171★): https://github.com/ais-lab/pl2map

2. D2S (72★): https://github.com/ais-lab/d2s

3. FeatLoc (7★): https://github.com/ais-lab/featloc

HONORS AND AWARDS

Research Grant For Doctoral Student   Aug. 2024
For a short-term exchange at the Technical University of Munich, Germany (JPY 500,000)

Research Encouragement Award   Feb. 2024
Recognition for high-quality research results at Ritsumeikan University in 2023

Research Grant For Doctoral Student   Jan. 2024
For a foreign research exchange (JPY 300,000)

Young Author Award   Jan. 2024
SICE International Young Author Award, with prize money of JPY 100,000 in SII2024

Excellent Research Award   Mar. 2023
Recognition for high-quality research results at Ritsumeikan University in 2022

Japanese Government Scholarship (MEXT)   Oct. 2022 – Sep. 2025
Merit-based grant for students pursuing Ph.D. education in Japan

Candidates to be student representatives at the degree awarding ceremony   Spring 2022
Chosen based on overall academic and research performance during M.E. study

Japanese Government Scholarship (MEXT)   Oct. 2020 – Sep. 2022
Merit-based grant for students pursuing M.E. education in Japan

Third Prize of Science Research Competition for Student   May 2019
Prize for research results on evolutionary algorithm in the automation of antenna design

SKILLS

Languages: Strong reading, writing and speaking competencies for English and Vietnamese.
Programming: Python (Pytorch, NumPy, SciPy, Matplotlib, Pandas), C/C++, Assembly, MATLAB.
Document Creation: Microsoft Office Suite, LaTex, Markdown.