PENG Luyuan

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Research interests

Field robotics, novel view synthesis, applied machine learning, computer vision

Education

National University of Singapore (NUS) — Singapore
PhD candidate in Electrical and Computer Engineering — Aug 2020 – Present
Supervisors: Assoc. Professor Mandar Chitre and Dr. Hari Vishnu. *GPA: 4.3.*
Thesis topic: Tetherless control of remotely operated vehicles

Nanyang Technological University, Singapore (NTU) — Singapore
B.Eng in Aerospace Engineering with 2nd major in Finance — Aug 2016 – Jun 2020
Supervisor: Dr. Basman Elhadidi. *GPA: 4.0.*

Technische Universiteit Delft — Delft, Netherlands
Exchange, Aerospace Engineering — Feb 2018 – Jul 2018

Honors and scholarships

Women in Engineering (WIE) Propel Laureate	2024
SGInnovate Summation Award (SGInnovate)	2019
President Research Scholar (NTU)	2019
KKH Scholarship (Wilmar International)	2019

Publications

Pose Estimation from Camera Images for Underwater Inspections
Luyuan Peng, Hari Vishnu, Mandar Chitre, Yuen Min Too, Bharath Kalyan, Rajat Mishra and Soo Pieng Tan
Journal of Oceanic Engineering (under review).

Improved Image-based Pose Regressor Models for Underwater Environments
Luyuan Peng, Hari Vishnu, Mandar Chitre, Yuen Min Too, Bharath Kalyan and Rajat Mishra
AUV Symposium, 2022.

Regressing Poses from Monocular Images in an Underwater Environment
Luyuan Peng and Mandar Chitre
OCEANS Chennai, 2022.

Research experience

Model-based Image Compression for Real-Time Transmission via Acoustic Links — May 2022 - - Present
Supervisors: Assoc. Professor Mandar Chitre and Dr. Hari Vishnu (NUS)
Designed and developed advanced deep learning algorithms as part of the Collaborative Human Robot Inspection & Intervention System for challenging underwater environments; spearheaded data collection and on-site testing, enhancing system accuracy and operational efficiency. Led team discussions to innovate and refine technology solutions, resulting in improved virtual tethering capabilities for remotely operated vehicles, demonstrated successfully in field trials.

Image-based Localization in Underwater Environments ⠀⠀⠀⠀⠀⠀⠀⠀⠀ Aug 2021 – Present

Supervisors: Assoc. Professor Mandar Chitre and Dr. Hari Vishnu (NUS)

Implemented a regression learning method, which is simple and cost-effective, for re-localization in underwater re-inspection missions. Achieved accurate pose estimation from monocular RGB images. Evaluated method on datasets collected from an underwater simulator, water tanks and Singapore waters. Investigated and improved its performance in generalization and its robustness towards changes in lighting.

Tilt-wing Quadcopter ⠀⠀⠀⠀⠀⠀⠀⠀⠀ Jul 2019 – Jun 2020

Supervisor: Dr. Basman Elhadidi (NTU)

Examined whether incorporating a wing onto an existing quadcopter would improve range, endurance and power efficiency. Built a mathematical model using MATLAB to investigate the effectiveness of tilt-wing quadcopter in theory. Designed experimental infrastructures using SolidWorks, assembled the setup and tested it in a closed-loop wind tunnel. Found that tilt-wing quadcopter show significant improvement in performance.

Development of a Cervical Traction Device ⠀⠀⠀⠀⠀⠀⠀⠀⠀ Aug 2018 – Aug 2019

Supervisor: Assoc. Prof Chou Siaw Meng (NTU)

Modified a gravity-assisted cervical traction device by designing a cushion to improve its comfort level. Evaluated the effectiveness of the modified device by conducting user trials with 20 participants and analyzing the feedback. Revised and improved the current design and measurement process to achieve more consistent and reliable results.

Volunteering

OCEANS Halifax 2024

Local Arrangement Chair ⠀⠀⠀⠀⠀⠀⠀⠀⠀ May 2024 – Present

Volunteered to assist the planning and execution of the career networking tour.

OCEANS Singapore 2024

Local Arrangement Chair ⠀⠀⠀⠀⠀⠀⠀⠀⠀ Jan 2024 – May 2024

Oversaw the coordination of events at the OCEANS Singapore 2024 conference, spearheaded the planning and execution of the career networking tour, technical tours and cultural immersion events for over 700 participants.

IEEE OES Summer School 2024 ⠀⠀⠀⠀⠀⠀⠀⠀⠀ Nov 2023 – Apr 2024

Coordinated logistics and operational tasks for the IEEE OES Summer School 2024, ensuring smooth execution of educational sessions and enhancing participant engagement and learning outcomes.

Sinagpore AUV Challenge 2024 ⠀⠀⠀⠀⠀⠀⠀⠀⠀ July 2023 – Apr 2024

Led the development of competition rulebooks and managed first-round judging for the Singapore AUV Challenge 2024. Actively contributed as a diver, ensuring fair play and safety during live events, directly impacting the competition's success.

AUV Symposium 2022 ⠀⠀⠀⠀⠀⠀⠀⠀⠀ Jan 2022 – Sept 2022

Orchestrated event logistics for the AUV Symposium 2022, successfully managing arrangements for 150 participants, which boosted the event's operational efficiency.

Skills

Programming

Proficient in: Python and MATLAB. Familiar with Julia.

Languages

Fluent in English and Mandarin

Other interests

Scuba diving, tennis, cooking and travelling.