

SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING

Website: <https://cde.nus.edu.sg/ece>

Area: Communications & Networks

Host: Assoc Prof Mandar Anil Chitre

TOPIC	:	Regressing Poses from Monocular Images in Underwater Environment
SPEAKER	:	Ms Peng Luyuan Graduate Student, ECE Dept, NUS
DATE	:	Thursday, 21 April 2022
TIME	:	10.30AM to 11.00AM
WEBINAR	:	Join Zoom Meeting https://nus-sg.zoom.us/j/88683474826?pwd=UDZEWU1VMStQQ0QvdjNyZWNKR0RaUT09

ABSTRACT

Re-localization is crucial to underwater vehicles especially for short-range missions, such as inspection and maintenance. While re-localization has been tackled successfully in the land and aerial environments, it remains to be a challenge in the underwater environment where radio communications and global positional systems are unavailable. Traditionally, underwater localization methods include dead reckoning (DR), inertial navigation systems (INS), and acoustic sensors. However, DR and INS tend to accumulate errors over time and are vulnerable to changes in water speed while acoustic sensors often require complex architectures which are expensive. As such, they are not suitable for short-range inspection missions. Inspired by recent progress in land re-localization methods, we implemented a regression learning method, which is simple and cost-effective, for re-localization in short-range missions. The method uses a deep network as a feature extractor and a fully connected layer as an affine regressor. It is able to regress a 6-DOF pose from a single RGB image. We trained and evaluated the method on datasets collected from an underwater simulator. The results showed that the implemented method can achieve very accurate pose estimation. We also investigated its robustness towards changes in lighting and made improvements.

BIOGRAPHY

Ms. Peng is now an M.Eng. student from the Department of Electrical and Computer Engineering, NUS. Her research interests include underwater image compression and underwater pose estimation. Prior to joining NUS, Peng received her B.Eng in Aerospace Engineering from Nanyang Technological University, Singapore, in 2020.

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