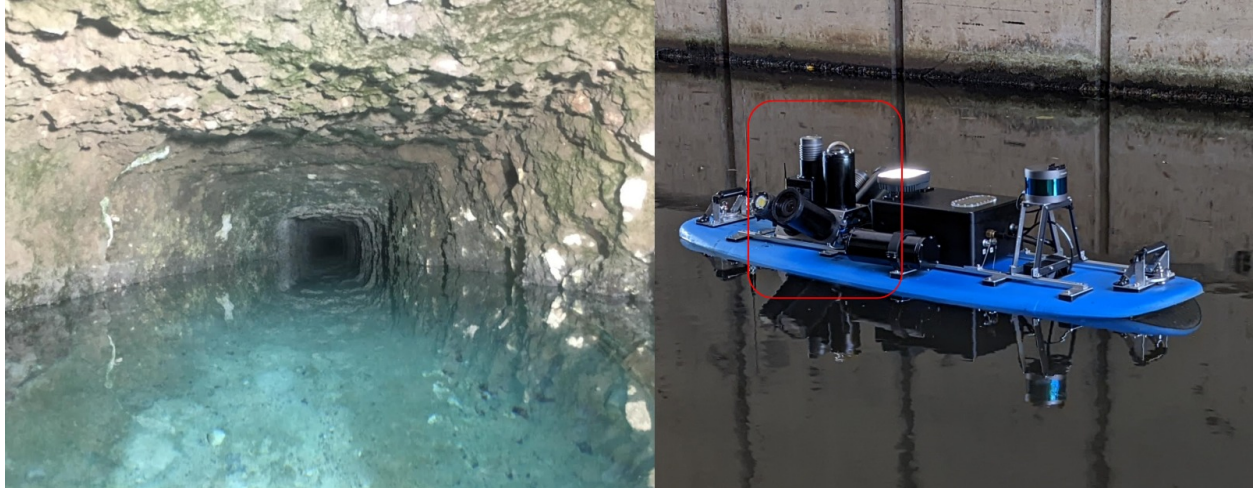


Robotics Software Engineer - Case Study

Introduction

Abyss is tasked to inspect a half submerged tunnel. In order to do that, the robotic platform is equipped with 3 cameras in a fan view orientation covering the full 180 degrees above water. In this case study, we will evaluate the ability to design and implement a ROS (Robot Operating System) node that merges the 3 image streams into a single panoramic image.



Your Task

As a robotics software engineer, you are responsible for the task of writing the ROS node which is responsible for handling the image streams. The resulting panoramic image should be published to a review topic for display. The bag file supplied with this case study contains a sample dataset of 3 cameras streaming.

- Write your code in Python
- The ROS node should subscribe to the three image topics
- The images have overlapping regions
- The panoramic image should be generated in real-time
- The resulting panoramic image should be published to a review topic
- You can use off the shelf libraries for merging the image streams or just stack the images together
- If you want, you can use the intrinsics / extrinsics provided
- You can use either ROS1 or ROS2
- Please, only spend 2-3 hrs to complete this exercise

Marking criteria and considerations

- ROS Knowledge
- Image Processing Knowledge
- Quality of the output image
- Software Architecture
- Real-time Performance
- Documentation
- Configurability

Submission Instructions

- Create a GitHub repository for your code
- Commit your code and documentation to the repository
- Provide clear instructions for building, running, and testing the node in the README file
- Share the repository link with the hiring team for evaluation 24 hours before your interview time