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Title:

Development of Underwater Pipe Crack Detection System for Low-Cost Underwater Vehicle using Raspberry Pi and Canny Edge Detection Method

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Abstract:

The effective loading area decreases because of cracking, leading to a rise in stress and eventual structural failure. Monitoring for cracks is an important part of keeping any pipeline or building in excellent working order. There are several obstacles that make manual inspection and monitoring of subsea pipes challenging. The fundamental objective of this study is to create a relatively inexpensive underwater vehicle that can use an image processing technique to reliably spot cracks on the exteriors of industrial pipes. The tasks involved in this project include the planning, development, and testing of an underwater vehicle that can approach the circular pipes, take pictures, and determine whether there are fractures. In this project, we will utilize the Canny edge detection technique to identify the crack. The system could function in either an online or offline mode. Using a Raspberry Pi and a camera, the paper will discuss the procedures followed to locate the pipe cracks that activate the underwater vehicle. While Python is used for image processing to capture photographs, analyze images, and expose flaws in particular images, the underwater vehicle's movement will be controlled via a connected remote control. When the physical model has been built and tested, the results are recorded, and the system's benefits and shortcomings are discussed. © 2022,International Journal of Advanced Computer Science and Applications.