

# **OIL SPILL DETECTION**

**A PROJECT REPORT**

*Submitted by,*

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*Under the guidance of,*

**Dr. MURALI PARAMESWARAN**

*in partial fulfillment for the award of the degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING,**

**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**

**At**



**PRESIDENCY UNIVERSITY**

**BENGALURU**

MAY 2025

**PRESIDENCY UNIVERSITY**  
**SCHOOL OF COMPUTER SCIENCE ENGINEERING**

**CERTIFICATE**

This is to certify that the Project report "OIL SPILL DETECTION" being submitted by "PULI VENKATA SAI PRANEETH", "BACHHU SATYA CHARAN", HARI PRADHAN S D", "TATIKONDA BHARGAV NAIDU" bearing roll number(s) "20211CAI0169, 20211CAI0171, 20211CAI0172, 20211CAI00163, in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering , Specialization in Artificial Intelligence and Machine Learning , is a bonafide work carried out under my supervision.

  
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### DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **OIL SPILL DETECTION** partial fulfillment for the award of Degree of **Bachelor of Technology in Computer Science and Engineering**, Specialization in Artificial Intelligence and Machine Learning, is a record of our own investigations carried under the guidance of **Dr. Murali Parameswaran, Professor, School of Computer Science and Engineering & Information Science, Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

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## ABSTRACT

Oil spills that need to be identified and managed have become an immediate environmental need because of their damaging effects on aquatic environments and wildlife as well as the local economy. Oil spills do not only cause permanent damage to the environment, but also threaten aquatic environment, as well as cause significant economic effects, where fishing and tourism in particular suffer. Necessary and precise determination of oil spills is very important in order to reduce the sphere of damage and make it possible to provide effective containment and cleanup efforts. The objective of this project is the desire to use satellite imagery to identify and predict where oil spills take place, through the use of highly advanced machine learning approaches towards describing and labelling slices of images. Our work has been enhanced by using data from Kaggle with an eclectic set of spectral and spatial traits received from satellite observations of maritime environments. With the help of the analysis of these features, we have a possibility to understand water surface properties in a comprehensive way, which helps to identify oil spill risks in a reliable way.

The proposed method takes advantage of several high-performing machine learning algorithms (Support Vector Machine (SVM), Random Forest and XGBoost) to accurately classify whether image patches are oil spill or non-oil spill. These algorithms were chosen for their ability to handle complex data patterns with high degree of precision. Real-time satellite imagery analysis is carried out by the system, which enables quick assessment of large sets images. The system is developed with Python, which is a popular language, particularly successful in machine learning and data manipulation, analysis. Image data processing within the system is seamlessly integrated with a simple front-end interface built with HTML, CSS, and JavaScript. It is possible for the users to easily engage with the system, upload satellite images, and see the results of oil spill identification using a simple format.

The proposed oil spillage detection system will enhance maritime ecosystem surveillance to ensure that cases of oil spillage will be managed in a more efficient manner. By automating the detection process across the system, response actions will be faster and limit the negative impacts to the environment and economy. Also, the system's flexibility ensures its adaptability to deployments in different maritime environments as a critical resource for governments and NGOs that are committed to preventing oil spills. With this project, an advanced automated system is introduced which develops environmental sustainability by addressing one of today's greatest threats to ecosystems across the world.