# Detection and Classification of Mine-Like Objects in Side Scan Sonar Imagery

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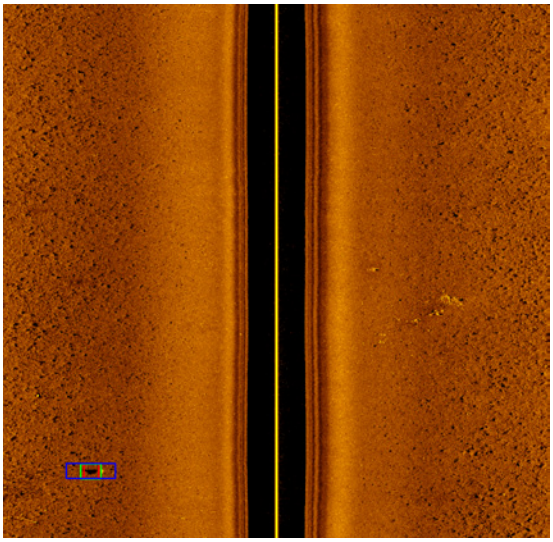

*Abstract*

*The task of detecting mine-like objects (MLO's) in side scan sonar (SSS) imagery has a profound impact on our military operations. The current process relies on subject matter experts to spend time analyzing sonar images in search of any MLO's. An automated approach would carry substantial time and cost benefits. The automation concept has been heavily researched over the years without a definitive solution that outperforms the manual approach. This paper surveys the techniques that have dominated the research and posits the use of common computer vision features optimized with machine learning to address the problem. With this new approach in mind, we consider three known feature types and the boosting approach to machine learning on our synthetic database of side scan sonar images. The nature of boosting, which requires large numbers of positive and negative examples, combined with the lack of existing data sets with ground truth warrants a synthetic alternative. Our partially synthetic database is produced by combining real world sonar images both with and without mine types present. The results of the considered algorithms on our database reinforce the difficult nature of this problem and show the potential for utilizing the features and methods prominent in computer vision approaches to optical imagery.*

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