

Using Machine Learning to Prevent Biofouling in Marine Environments

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Abstract

Developing novel approaches to detect and prevent biofouling in Polyethylene molded products is key to the marine industries. In many cases, these Polyethylene products fail to perform their intended function if they acquire too much fouling on the surface. There are two primary methods currently used to reduce the fouling on these polyethylene structures: preventative and maintaining. In maintaining measures, the structures are regularly cleaned and the surfaces is scrubbed or poisoned in order to remove the organisms. In preventative, the structure is either treated with an antifoulant or the surface is formulated in a manner that helps to prevent the organisms from either attaching or growing in the first place. Earlier research done using the realtime data collected over a span of three years at the Poseidon Testing Center in Tuticorin Bay India has provided evidence of an accelerated growth environment to evaluate these antifoulants. In this research effort, we will be using a predictive approach based on machine learning using the previously collected real-time data to determine the lifespan of these antifoulants as a function of the amount of antifoulant used. The developed will be also used to predict the use of different antimicrobials in

varying concentrations to protect Polyethylene molded products from developing prohibitive fouling in marine environments. The prediction results (algorithms with prediction accuracy of 80% and higher) will then be used to evaluate and optimize the design criteria used for surfaces to provide effective protection against biofoulings

Biography

Trent Kelly is a Production and Quality Control Engineer at BTG Products. Buffalo Technology Group (BTG Products) was established to commercialize a novel antimicrobial technology developed at West Texas A&M University. The technology was first developed as a Department of Defense project to combat dangerous bacteria such as anthrax. After successfully completing the project, the BTG team began to develop alternative solutions to many commercial and consumer threats from SRB bacteria in oil pipelines to common household mold. BTG's mission is to produce highly effective products to fight against the many problems.