

TITLE: Machine Learning Framework of automated radiated noise analysis for marine vessels

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Abstract :

The noise radiated from marine vessels into the ocean medium as a by-product of their operations has varied significance based on their stakeholder. The military platforms from the perspective of their acoustic stealth expose their vulnerability to detection by their adversaries based on the radiated noise. The marine environmentalists are concerned with the growing low frequency radiated noise in the oceans causing severe acoustic habitat degradation for the marine animals. It is well known that marine animals perceive the environment around them through sound and the growing low frequency ambient noise in the ocean due to shipping (in the order of 3 dB per decade) is severely interfering with their acoustic perception of the habitat. Thus, radiated noise analysis of marine platforms is critical and interesting research problem for underwater acoustic researchers, sonar designers, marine environmentalists, policy makers, maritime military practitioners and strategists, and many more. The ongoing manual efforts in radiated noise analysis have significant limitations due to subjective human factor and lack of standardizations. The enormous volume of data and the variations of their characteristics necessitates machine learning framework to evolve over time and increasing inputs to the system. This work attempts to formulate a machine learning framework for automated radiated noise analysis of marine platforms in the underwater medium. This will facilitate an objective radiated noise analysis that will present a qualitative and quantitative presentation of the levels and their characteristics specific to the application. The initiative will allow practitioners and policy makers to plan tactical and strategic actions to better manage the maritime environment for a safe, secure and sustainable growth.

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