

## Abstract

English title: Visual inspection of the underwater objects' surfaces using Structure from Motion method.

The subject of this work is to evaluate the effectiveness of determining the technical condition of the external surfaces of underwater objects by the Structure from Motion method using photograms, assuming that this method allows qualitative and quantitative evaluation of the analysed photogram showing a fragment of the surface or the entire underwater object with satisfactory engineering-grade survey accuracy. The thesis discusses the problems of remote underwater surveys (sensing), visual inspection of underwater objects, and categorises the types of underwater objects that can be subject to the underwater visual inspection. The influence of external factors on underwater inspection is characterised, including issues of underwater optics and photogrammetric processes. A detailed description of the theoretical basis behind the Structure from Motion is provided. The study included measurements of models under laboratory and real conditions, followed by analyses of models created for the test objects based on the proposed performance measures. The results of the research do not allow to conclude that the mentioned method allows for determining the technical condition of underwater objects with the assumed high thresholds of qualitative and quantitative assessment, it was also proved that visual inspection using the Structure from Motion method is subject to several complex environmental and optical aspects that may nullify the achievement of satisfactory results. The paper also identifies a way forward for further research work that can help overcome the problems, as well as develop the application algorithm of this method to a desired level.