Processing of Big Data for 3D Multibeam Sonar (water) and Lidar Point Cloud (land) in Hydrography Field

Wioleta Błaszczak-Bąk (Poland)

Key words: Hydrography

SUMMARY

In this work, I present a new approach to acquiring and simultaneously processing two different datasets of measurements: (1) bathymetric observations, (2) laser scanning data. This is an integrated approach allows to processing water and land areas.

This a new way of dealing with measuring big datasets includes fragmentary data acquisition, fast reduction (Optimum Dataset method) within acquired measuring strips in almost real time, and generation of DTMs.

The proposed data processing methodology can be used for integrated measuring systems. Such a system suggests the Marine Technology sp. z o.o. in Szczecin. The fully functional prototype of HydroDron-1 was made as a result of the project "Developing an autonomous/remote-controlled floating platform dedicated to hydrographic measurements in limited water bodies".

The known reduction OptD method was used for this purpose. The modify of OptD algorithm relies on closing the OptD method in a loop (FOR...NEXT) for staged of data processing.

Simultaneous data acquisition from multibeam echosounders (MBES) and Light Detection and Ranging (LiDAR) results in the collection of large amounts of observations. Therefore, an approach has been proposed to reduce the number of these observations in almost real time.

All processes in proposed approach are performed in a first stage viz in datasets acquisition, with the difference that during measurement not the whole dataset is processing, but a fragment of the dataset. Data acquisition, data processing, reduction amount of observations and 3D model generation in hydrography in almost real time is important research subject in context of

Processing of Big Data for 3D Multibeam Sonar (water) and Lidar Point Cloud (land) in Hydrography Field (10402)
Wioleta Błaszczak-Bąk (Poland)

FIG Working Week 2020
Smart surveyors for land and water management
Amsterdam, the Netherlands, 10–14 May 2020

comparative navigation and land and water management.