Digital Ports

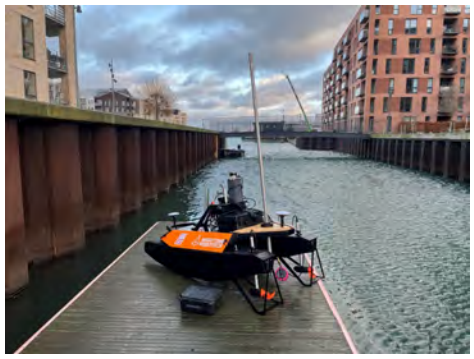
Width 108cm

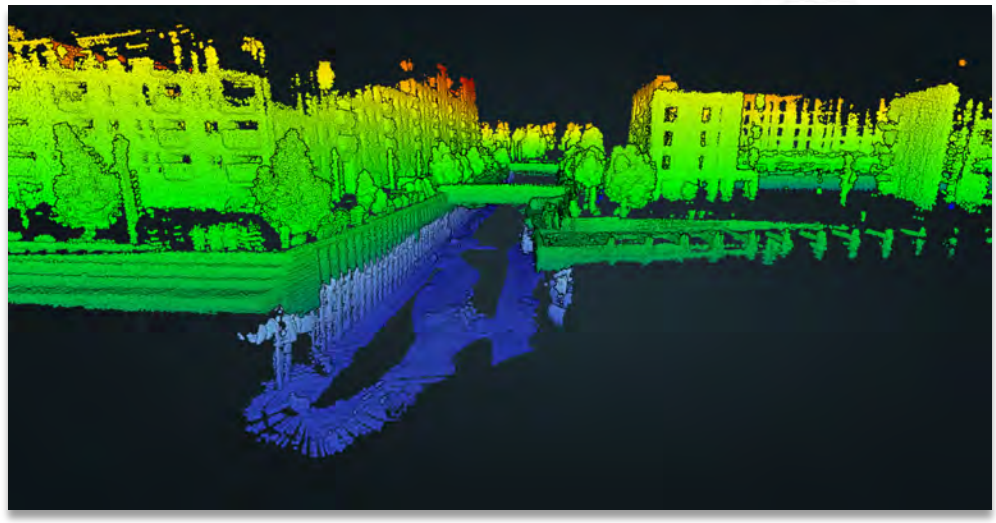
Height
81.5/106.5cm

Overall length 200cm

20 hours (2kn)

55/65kg





Project Description:
The Digital Ports project aims to develop an advanced digital twin of the Copenhagen Harbour, integrating high-resolution mapping data acquired through sonar and LiDAR technologies. The project involves processing and visualizing this data in a detailed 3D point cloud environment, from which a regularized mesh will be extracted for use in hydrodynamic modelling of pollutant dispersion within the harbour. The entire workflow—from data acquisition to modelling and visualization—will be implemented using standard, web-accessible digital tools, enabling interactive online exploration and analysis. The project is in collaboration with DHI.

Learning Objectives:
- Understand the principles and applications of digital twin technologies in maritime environments.
- Gain practical experience to operate sonar and LiDAR for data acquisition, processing, and visualization
- Learn to generate and optimize 3D meshes suitable for environmental and hydrodynamic simulations.
- Perform test simulation of pollution dispersion using DHI's models
- Develop skills in integrating modelling outputs with web-based visualization platforms for digital collaboration and communication.

Competences to develop:
- Basic knowledge of geospatial data formats and 3D modelling concepts.
- Familiarity with data processing and visualization software (e.g., CloudCompare, QGIS, Blender).
- Understanding of hydrodynamics or environmental modelling principles.
- Experience with programming or scripting for data handling (e.g., Python, MATLAB).
- Ability to work with web-based visualization frameworks or digital twin platforms.

Notes: The project is suitable for group thesis. Supervisors Patrizio Mariani, pmar@dtu.dk and Fletcher Thompson, fletho@aqua.dtu.dk. DHI will provide advice on the data acquisition and modeling work. Possible collaborations with DTU Elektro on advanced more sensor fusion applications.