MobiSpaces

CrowdSea Mapping

Federated Learning for Enhancing Nautical Charts

Danish Geodata Agency

emisia
CONSCIOUS OF TRANSPORT'S IMPACT

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A nautical chart is a map of a sea area and coastal regions, and one of the main challenges with navigational charts is to keep these up-to-date and to determine where effort should be put into resurveying an area. Surveying large sea areas is both time consuming and expensive, and every year only limited and prioritized areas are resurveyed.

This use case will validate how crowdsourced nautical sensor data can be processed directly onboard vessels, and qualified for improving navigational safety at sea, using a decentralized data acquisition and Federated Learning approach. The Federated Learning approach will prioritize what information is urgent to share with the centralized server and what can wait until connected to a low-cost communication channel, and in the end updating nautical charts.

Targeted Stakeholders


Vessels


Citizens - End Users


Policy Makers

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MobiSpaces

How will CrowdSeaMapping Use Case improve Nautical Charts?

- Reduce slow and expensive data communication, while collecting CSB data by maintaining depth models on the decentral vessels.
- Utilize CSB data for detecting imprecisions to existing nautical charts, where depth measured from sensors does not match with charted depths.
- Generic verification of charts, where larger areas of CSB data is compared to existing charts.
- Consider utilizing CSB data for actually charting sea areas where no surveying has been performed or where quality of existing surveys are questionable.

Expected Outcomes

1. Better accuracy in nautical charts, identifying potential chart discrepancies.
2. Generic verification of charts.
3. Charting sea areas unknown since today.

Quote from the Use Case representative

Niels Tvilling Larsen
Head of Department,
Danish Geodata Agency

One of the main challenges with navigational charts, have always been to keep these up-to-date, together with resurveying large sea areas, which is both time consuming and expensive. Through MobiSpaces we will be able to explore new ways to tackle these challenges, improving navigational safety at sea.

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