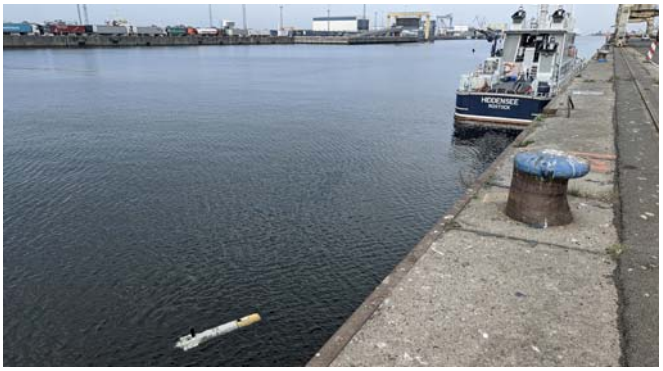
Revolutionizing In-Water inspections

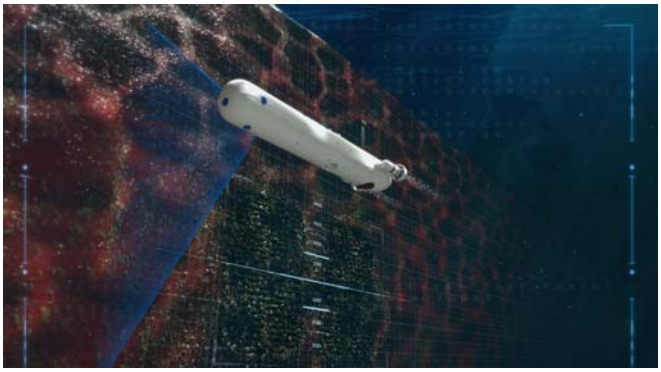
The increasing demand for remotely conducted in-water surveys (IWS) requires sophisticated automated concepts. Austrian company Subdron has initiated »Robotics as a Service« applications that can support maritime infrastructure monitoring

The maritime industry stands on the brink of a technological revolution with the emergence of autonomous robotic solutions for underwater inspections. Among the pioneers in this field is Subdron startup, whose innovative technology is poised to redefine the standards of efficiency, precision, and cost-effectiveness in maritime maintenance. Their vision embodies a future where in-water hull inspections are conducted seamlessly, revolutionizing how maritime assets are managed and maintained.

The hallmark of Subdron's technology lies in its capacity to execute fully autonomous data collection, minimizing user interaction while ensuring unparalleled accuracy in confined underwater environments. The proprietary technology enables the generation of highly accurate 3D reconstructions of submerged structures, even in zero visibility scenarios. This breakthrough is set to create substantial value for port authorities and ship owners by facilitating comprehensive monitoring of underwater assets and enabling predictive maintenance strategies.

At the heart of Subdron's innovations is their mission to offer »Robotics as a Service« that support diverse infrastructure monitoring needs, including ports, waterways, offshore structures, and ships. Their specialization in navigation algorithms and autonomous underwater vehicle (AUV) technology empowers them to collect and evaluate inspection data with exceptional precision. This strategic focus enables Subdron to provide invaluable services to clients without the necessity of developing their own technologies, thereby eliminating the need for continuous training and retention of specialized personnel.





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»Robotics as a Service« applications to support infrastructure monitoring in ports and on waterways, offshore structures and ships

The technology's applications span various facets of maritime operations. In-water surveys for structural integrity assessments and post-damage surveys mandated by classification societies can be conducted seamlessly, minimizing downtime and ensuring compliance. Moreover, the technology facilitates accurate geometry digitalization of hulls and propellers, crucial for retrofits, simulations, and optimizing hydrodynamic knowledge bases.

One key is the capability in biofouling documentation, allowing precise monitoring before and after cleaning events. This service offers ship owners accurate insights through 3D maps detailing biofouling quantity and exact positions, facilitating proactive hull maintenance strategies.

They propose automatized data processing of the collected information thanks to machine learning algorithms, 3d point cloud anomaly detection and accurate position and accumulation of biofouling. The autonomous robotic solutions present a monumental shift from traditional methods that relied currently on human divers or remotely operated vehicles (ROVs). The technology operates autonomously, overcoming challenges posed by murky visibility in sediment-laden waters and reducing reliance on qualified pilots, thus streamlining operations.

The core vehicle, Sparus II AUV from IQUA Robotics, modified by Subdron, represents a high-performance carrier equipped with sensors such as GPS, INS, DVL, MBES, and sonar systems. This torpedo-shaped vehicle ensures efficient hydrodynamics for extended operational periods, guaranteeing high-resolution data acquisition critical for detailed analysis.

The data processing algorithm developed by Subdron plays a pivotal role in transforming raw data into actionable insights. By correlating fan data with navigation data, the algorithm generates high-definition 3D point clouds with exceptional resolutions. The result is a detailed and comprehensive analysis surpassing conventional survey methods.

In real-world scenarios, the technology has demonstrated remarkable efficacy in the Port of Hamburg (North Sea) and the Port of Rostock (Baltic Sea). The system successfully scanned ship hulls even in very low visibility conditions, detecting and reconstructing foreign objects swiftly. Such applications underscore the technology's adaptability and reliability, paving the way for broader applications in security, damage inspections, and beyond.

This article is an updated version of the paper written for the HIPER conference. (HANSA 11 | 23)

Authors:
Thomas Vonach
Arnau Carrera Viñas
Subdron