All categories

Thu. Nov 12, 2026 11:00 AM - 12:30 PM JST | Thu. Nov 12, 2026 2:00 AM - 3:30 AM UTC | Room A (Oshidori) (2F)

Demos A1

Chair: Akihiro Inomata, Laura Rogers

12:00 PM - 12:20 PM JST | 3:00 AM - 3:20 AM UTC

[6sWwrMMb-04] iSeaPower: An Interactive Decision-Support Digital Twin Platform for Offshore Management

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As Europe works toward climate neutrality by 2050, offshore wind is expanding rapidly increasing the need for integrated management and sustainable co-use of increasingly crowded marine space. The cost-efficient, and safe deployment, operation, and maintenance of offshore wind farms depend on reliable meteorological and oceanographic forecasts. In particular, the accurate identification of suitable weather windows is essential for safe and efficient offshore activities as forecast uncertainties lead to costly delays and increased operational risk. Simultaneously, offshore management increasingly requires decision-support tools that can integrate multiple activities, environmental conditions, and user requirements within a common digital framework. Consequently, decision-support systems can formalize key concepts such as accessibility, and approachability, and combine them with user-defined operational constraints, to improve the planning of activities ranging from routine inspections to major maintenance campaigns and coordinated operations. We introduce iSeaPower, a web-based Digital Twin of the Ocean (DTO) interactive decision-support platform for offshore renewable energy operations and multi-use applications. iSeaPower integrates model and observation data covering a wide range of temporal scales and translates them into actionable information for specific decision problems. Its modular architecture provides a basis for extension beyond individual offshore environment, and the co-use of offshore space, including combined activities such as offshore wind energy and aquaculture. For example, iSeaPower supports uncertainty-aware planning, and provides an interactive workflow that links geospatial selection, constraint definition, and decision outputs. The modular framework enables the integration of AI-based methods, and the intelligent exploration of complex operational scenarios. By integrating data, models, AI, and user interaction, iSeaPower supports adaptive DTO-based decision-making and enables users to explore heterogeneous data and operational scenarios across multiple spatial and temporal scales. Consequently, iSeaPower contributes to the DITTO vision of interoperable and user-driven Digital Twins of the Ocean that connect data, models, advanced digital technologies, and users to support ocean management.

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