Fraunhofer IOSB-AST

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Together with our clients, we develop customized, resilient and future-oriented system technology solutions for complex, dynamic and time-variant processes in the application areas of energy supply, semi- and fully autonomous work vehicles and underwater robotics. Through our scientific work, we provide excellent preliminary research for the benefit of our clients and society as a whole.

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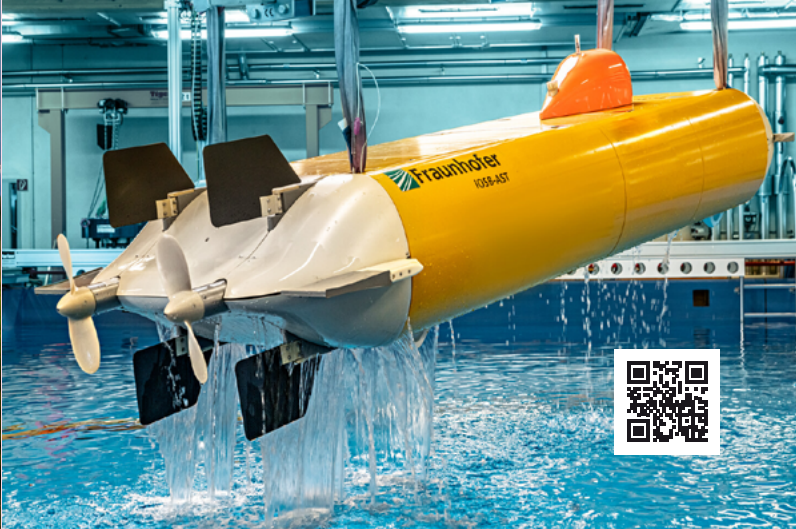🌐 www.iosb-ast.fraunhofer.de/en
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Cutting-edge technology for complex systems

Cognitive Energy Systems

The »Cognitive Energy Systems« department focuses on leveraging information and communication technologies to develop cognitive, assistance-oriented system solutions in the energy sector. This includes the development of energy management and data systems, operational management of energy grids, and solutions for technical and business processes in energy trading.

Research efforts are directed towards energy management solutions for districts and industries, charging management for electric vehicles, and the application of quantum computing in energy management.

The Cyber Security for Energy and Water (LLCS) learning lab conducts research on IT/IoT security for critical infrastructures and provides industry-specific training.

Among other things, AI technologies are utilized to automatically detect and pinpoint operational disruptions, ensuring the stable operation of energy grids.

Embedded Intelligent Systems

The Embedded Intelligent Systems department specializes in system integration, including sensor technology and communication solutions, as well as modeling, simulation, guidance, and monitoring for partially and fully autonomous work vehicles, such as service robotics or robotics in challenging environments. An example is the research project »AKIT - Autonomy kit for near-series work vehicles for networked and assisted recovery from sources of danger«, where a complex recovery scenario was implemented in collaboration with industry and science partners.

Another area of focus for the department is the Smart UV Systems research group, which focuses on system solutions utilizing semiconductor-based UV radiation sources (UV LEDs). During the coronavirus pandemic, a disinfection solution for the interior of ambulances was developed in collaboration with BINZ Automotive GmbH.

Underwater Robotics

The Underwater Robotics department conducts research in the field of remote-controlled, semi-autonomous and autonomous underwater vehicles, developing control systems and hardware components for them. The department has several multifunctional ROVs (Remotely Operated Vehicles) and a test basin dedicated to research and customer projects.

Successful deployments include underwater archaeology missions in the Süßen See and Arendsee lakes. Additionally, the department has developed an autonomous underwater rescue robot for use in swimming pools and bathing lakes. In 2020, the transfer network »Automotive goes Subsea« was launched in Ilmenau to establish technological connections between the Thuringian automotive sector and the maritime industry.

Another research focus of the department is modeling, simulation and decision support for complex water systems. The department is developing IT-supported modeling systems for water demand, catchment areas, and bodies of water.