

□ Areas of Research

- ◆ Port and Coastal Engineering
 - Computer-aided Port Design
 - Research of Earthquake and Tsunami
 - Research of moving Floater/Sediment within the port
 - Coast/Marine Structure design (Quay wall, Break water, Jetty, Dolphin, LNG terminal, Anchoring)
 - Floater Structure Analysis and Design
 - Port Environmental Engineering
 - Port Design

- ◆ Offshore Plant Engineering
 - Subsea production plants
 - LNG FPSOs
 - LNG fuel gas supply system for large carriers
 - LNG bunkering shuttles and bunkering terminals
 - CO₂ Carriers and offshore injection facilities
 - Risk-based design and system safety design
 - Fire and explosion risk analysis
 - System reliability engineering
 - Life-cycle economic analysis

- ◆ Underwater Technology
 - Underwater acoustics, underwater localization
 - Marine structural response analysis to underwater explosions
 - Naval and anti-submarine warfare technologies
 - Guidance, navigation and control of underwater vehicles
 - Underwater Robotics: Autonomous Underwater Vehicles(AUVs), Remotely Operated Vehicles(ROVs)
 - Biomimetic Underwater Robots, artificial muscles, graphene-based sensors and actuators

- ◆ Ocean Systems Modeling and Simulation
 - M&S (Modeling and Simulation) of Underwater Explosion
 - M&S of Ocean Synthetic Environment
 - RFID (Radio Frequency Identification), CAD/CAM, Product Lifecycle Management
 - Virtual reality and operator training system
 - Finite element modeling of floating structures and fluid-structure interaction

- o Continuum mechanics for large deformation, strain and inelastic behavior

- ◆ Ocean Systems Management
 - o Shipping & logistics
 - o Ship production systems engineering
 - o Accuracy control, tolerance analysis and synthesis
 - o Tolerance optimization for compliant metal plate assemblies considering welding distortions
 - o Simulation-based tools to support decision making in ship design/production system

- ◆ Ocean Environment and Renewable Energy
 - o Seawater desalination: Reverse-Osmosis Layer-by-Layer Composite Nano-Filtration Membrane
 - o Fluid Mechanics & Aquaculture: Mid/Large-scale fluid mechanics related to the habitation and migration of living organisms in the ocean
 - o Wave Mechanics: Surface Waves, Internal Waves
 - o Fluid-Body (Rigid, Elastic) Interaction
 - o Offshore wind power system: Fixed-type and Floating-type
 - o Wave power system: Wave focusing system
 - o Current power system: Self-excited oscillation type
 - o Ocean nuclear power system: Gravity-based structures
 - o Ocean Observation : Coastal Ocean Observation System (COOS)