

□ 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
  - CO<sub>2</sub> 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
  - Continuum mechanics for large deformation, strain and inelastic behavior
- ◆ Ocean Systems Management
  - Shipping & logistics
  - Ship production systems engineering
  - Accuracy control, tolerance analysis and synthesis
  - Tolerance optimization for compliant metal plate assemblies considering welding distortions
  - Simulation-based tools to support decision making in ship design/production system
- ◆ Ocean Environment and Renewable Energy
  - Seawater desalination: Reverse-Osmosis Layer-by-Layer Composite Nano-Filtration Membrane
  - Fluid Mechanics & Aquaculture: Mid/Large-scale fluid mechanics related to the habitation and migration of living organisms in the ocean
  - 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)