**SHIN HYUNG RHEE**

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# Employment Record

## Seoul National University, Seoul, Korea 2007 - Present

### Professor, Dept. of Naval Architecture and Ocean Engineering 2012 - Present

### Associate Dean for Planning and Strategy Affairs, College of Engineering 2020 - 2021

### Associate Dean for Educational Affairs, College of Engineering 2011 - 2013

### Associate Professor, Dept. of Naval Architecture and Ocean Engineering 2007 - 2012

## Seoul National University Foundation, Seoul, Korea 2015 - 2017

### Executive Director, TEPS Head Office

## Republic of Korea Naval Academy, Jinhae, Korea

### Visiting Professor 2017 - 2018

### Visiting Professor 2021 - 2022

## University of Central Florida, Orlando, Florida, USA 2008 - 2009

### Adjunct Lecturer, Dept. of Mechanical, Materials and Aerospace Engineering

## Fluent Inc., Lebanon, New Hampshire, USA 2001 - 2007

### Lead Engineer, Space, Defense, and Marine Industry Team 2005 - 2007

### Senior Engineer, Space, Defense, and Marine Industry Team 2004 - 2005

### Senior Engineer, Aerospace Industry Team 2004 - 2004

### CFD Engineer, Aerospace Industry Team 2001 - 2004

## National Maritime Research Institute, Tokyo, Japan 1999 - 2001

### Science and Technology Agency (STA) Fellow, Ship Performance Division

## The University of Iowa, Iowa City, Iowa, USA 1992 - 1999

### Postdoctoral Research Associate, Iowa Institute of Hydraulic Research 1998 - 1999

### Graduate Teaching Assistant, Department of Mechanical Engineering 1993 - 1995

### Graduate Research Assistant, Iowa Institute of Hydraulic Research 1992 - 1998

## Seoul National University, Seoul, Korea 1991 - 1992

### Graduate Research Assistant, Department of Naval Architecture

# Education

## B.A. 2015. 8 – 2017. 8 Korea National Open University, Seoul, Korea

### Major: Management

## Ph.D. 1992. 8 – 1998. 7 The University of Iowa, Iowa, USA

### Major: Mechanical Engineering

### Doctoral Thesis: Unsteady RANS Method for Boundary Layer and Wake and Wave Field

### Adviser: Prof. Frederick Stern

## M.S.E. 1990. 3 – 1992. 2 Seoul National University, Seoul, Korea

### Major: Naval Architecture

### Master Thesis: Effects of Stern Form Modification on Ship Resistance

### Adviser: Prof. Hyochul Kim

## B.S.E. 1986. 3 – 1990. 2 Seoul National University, Seoul, Korea

### Major: Naval Architecture

# Activities/Leadership

#### Member of the National Academy of Engineering of Korea, Associate Member 2022 – 2024, Member 2024 – Present (한국공학한림원 일반회원, 2022 – 2024, 정회원 2025 – 현재)

#### Member of the Korean Academy of Marine Science, 2024 - Present (한국해양한림원 석학회원, 2024 – 현재)

#### Member of the Advisory Committee, National Defense Industry Security Council, 2024 - Present (방산침해대응협의회 자문위원, 2024 – 현재)

#### Member of the Advisory Committee, Korea Polar Research Institute, 2024.12 – 2026.12 (선박해양플랜트연구소 정책자문위원회 자문위원, 2024.12 – 2026.12)

#### Member of the Foundation Promotion Committee, Naval War College, 2024.10 – Present (해군대학 발전재단 설립 추진위원회, 2024.10 – 현재)

#### External Member of the Policy Research Review Subcommittee, Future Force Development Headquarters, Defense Acquisition Program Administration, 2024 - 2026 (방위사업청 미래전력사업본부 정책연구심의소위원회 외부위원, 2024 – 2026)

#### Head of the Department of Naval Architecture and Ocean Engineering, 2022 – Present (서울대학교 조선해양공학과 학과장, 2022 - 현재)

#### President of the Korea Society of Computational Fluids Engineering, 2024 (한국전산유체공학회 회장, 2024)

#### Outside Director, Board of Directors, Hanhwa Ocean, 2023.05 – 2025.03 (한화오션 사외이사, 2023.05 – 2025.03)

#### Member of the Organizing Committee of the 1st Defense Industrial Security Conference, 2023 (제1회 방산안보 국제컨퍼런스 조직위원, 2023)

#### Member of the Policy Advisory Committee, Korea Research Institute of Ships and Ocean Engineering, 2023 - 2024 (선박해양플랜트연구소 정책자문위원회 자문위원, 2023 - 2024)

#### Chair of the Organizing Committee of the 1st Jeju International Green-Ship Expo, 2022 (제1회 제주 국제 친환경 선박 박람회 조직위원회 위원장, 2022)

#### Member of the Policy Advisory Committee, Ministry of Maritime Affairs and Fisheries, Korea, 2022 - 2025 (대한민국 해양수산부 정책자문위원회 자문위원, 2022 - 2025)

#### Member of the public-private joint TF team for the creation of a maritime smart city in Busan, 2022 - 2023 (부산광역시 해상스마트시티 조성 민관 합동 TF팀 위원, 2022 - 2023)

#### Member of the Navy Development Advisory Committee, the Republic of Korea Navy, 2022 – 2024, 2025.01 – 2026.12 (해군발전자문위원회 자문위원, 2022 – 2024, 2025.01 – 2026.12)

#### Member of the Technical Committee, Korean Register, 2022 - 2023 (한국선급 기술위원회 위원, 2022 - 2023)

#### Member of the Private Sector Advisory Committee and Naval Platfom Division, Korean Register, 2022 - Present (한국선급 함정사업단 민간자문위원, 2022 - 현재)

#### President of the Society of Naval Architects of Korea, 2022 - 2023 (대한조선학회 회장, 2022 - 2023)

#### Member of the National Academy of Engineering of Korea, 2022- Present (한국공학한림원 일반회원, 2022 – 현재)

#### Member of Organizing and Paper Selection Committee for Symposium on Naval Hydrodynamics by the US Office of Naval Research, 2021 - Present

#### Vice President of the Korea Society of Computational Fluids Engineering, 2021 - 2023 (한국전산유체공학회 부회장, 2021 – 2023)

#### President of Naval Ship Technology Committee, Society of Naval Architects of Korea, 2021 - 2022 (대한조선학회 함정기술연구회 회장, 2021 - 2022)

#### 해양경찰 AI 기반 차세대 스마트함정 설계·건조 자문단 전문위원, 2020

#### Fellow of the Society of Naval Architects and Marine Engineers, 2019 - Present (미국조선학회 석학회원, 2019 - 현재)

#### Fellow of the Royal Institution of Naval Architects, 2019 - Present (영국조선학회 석학회원, 2019 - 현재)

#### 대한민국 해군사관학교 해양연구소 해양과학기술 연구부 명예연구원, 2019 – 2021

#### 대한민국 해군사관학교 거북선 3차 건조 자문위원, 2019 - 2022

#### Member of the Board of Directors, the Korean Society for Marine Environment and Energy, 2012 - Present (한국해양환경에너지학회 이사, 2012 – 현재)

#### Member of the Planning Board for Innovation of Reasearch Regulation, Ministry of Science and ICT, 2018 - 2019 (연구제도혁신기획단 위원, 과학기술정보통신부, 2018 - 2019)

#### Member of the Specialist Committee of Combined CFD/EFD Methods for the 29th International Towing Tank Conference, 2018 - 2020

#### Associate Editor for Journal of Ship Research, 2018 - Present

#### Vice President of the Society of Naval Architects of Korea, 2018 - 2021 (대한조선학회 부회장, 2018 - 2021)

#### Member of the Jury Committee, Sailing Competition, 98th Korea National Sports Festival (제98회 전국체육대회 요트경기 심판위원), Chungbuk, Korea, 2017

#### Member of the Advisory Board for Defense Technology Protection, the Defense Acquisition Program Administration, 2017-2019 (방위사업청 방산기술보호 자문위원, 2017 - 2019)

#### Member of the International Scientific Committee for the International Symposium on Marine Propulsors, 2015, 2017, 2019, 2022, 2024

#### Member of the Local Organizing Committee for the 24th International conference on Port and Ocean Engineering under Arctic Conditions (POAC 2017), Busan, Korea, 2017

#### Member of the Organizing Committee, 50th Anniversary Commemorating Conference, Korea Federation of Science and Technology Societies, 2015 - 2016 (한국과학기술단체총연합회 창립 50주년 기념사업 조직위원회 위원, 2015 - 2016)

#### Member of the Board of Directors, Korean Society for Engineering Education, 2015 - 2016 (한국공학교육학회 이사, 2015 - 2016)

#### Secretary General of the Citizens' Coalition for the Realization of a Better Science and Technology Society, 2015 (바른 과학기술사회 실현을 위한 국민연합, 사무처장, 2015)

#### Secretary of the Jury Committee, Sailing Competition, 17th Asian Games, Incheon, Korea, 2014

#### Member of the Board of Trustees, the Korean Society for Marine Environment and Energy, 2014 - Present (한국해양환경에너지학회 평의원, 2014 – 현재)

#### Associate Editor for Journal of Mechanical Science and Technology, 2014 - 2019

#### Member of the Committee for Foreign Materials Recommendation, the National Library of Korea, 2014 - 2020 (국립중앙도서관 외국자료 추천위원, 2014 - 2020)

#### Editor in Chief of International Journal of Naval Architecture and Ocean Engineering, 2014 - 2022

#### Member of the Local Organizing Committee for the 10th Asian Computational Fluid Dynamics Conference (ACFD10), Jeju, Korea, 2014

#### Member of the International Advisory Committee for International Symposium on Cavitation and Multiphase Flow (ISCM2014), Tsinghua University, Beijing, China, 2014

#### Member of the Board of Trustees, the Society of Naval Architects of Korea, 2013 - Present (대한조선학회 평의원, 2013 - 현재)

#### Member of the Board of Directors, Korea Sailing Federation, 2013 - 2016 (대한요트협회 이사, 2013 - 2016)

#### Organizer of the 8th International OpenFOAM Workshop, 2013

#### Member of the OpenFOAM Workshop Committee, 2012 - Present

#### Member of the Board of Directors, Gyeonggi Yacht Association, 2013 - 2019 (경기도 요트협회 이사, 2013 – 2019)

#### Member of the Advisory Board, Korea Sailing Federation, 2012 - 2013 (대한요트협회 자문위원, 2012 - 2013)

#### Member of the Mentoring Supporters for National Research Facilities and Equipment, National Research Facilities and Equipment Center, 2012 - 2013 (국가연구장비 멘토링 지원단, 국가연구시설장비진흥센터, 2012 - 2013)

#### Member of the Specialist Committee of Computational Fluid Dynamics for the 27th International Towing Tank Conference, 2012 - 2014

#### Member of the Board of Directors, the Society of Naval Architects of Korea, 2012 - 2015 (대한조선학회 이사, 2012 - 2015)

#### Chair of the International Journal Committee, the Society of Naval Architects of Korea, 2012 - 2022 (대한조선학회 국제논문집위원회 위원장, 2012 – 2022)

#### Member of the Specialist Committee for Computational Fluid Dynamics, 27th International Towing Tank Conference, 2012 - 2014

#### Member of the Local Committee for the 1st Asian Wave and Tidal Energy Conference, Jeju, Korea, 2012

#### Member of the Advisory Committee, Korea Shipowners’ Association, 2011. (한국선주협회 2012년 여수세계박람회 해운항만산업 전시관 기획 및 설계 자문위원, 2011)

#### Member of the Board of Trustees, the Korea Society of Computational Fluids Engineering, 2010 - Present (한국전산유체공학회 평의원, 2010 - 현재)

#### Member of the Board of Directors, Seoul Yacht Association, 2010 - 2012 (서울시 요트협회 이사, 2010 - 2012)

#### Member of the Board of Directors, the Korea Society of Computational Fluids Engineering, 2009 - 2020 (한국전산유체공학회 이사, 2009 - 2020)

#### Associate Editor of International Journal of Naval Architecture and Ocean Engineering, 2009 - 2013.

#### Member of the Quality Systems Group, 26th International Towing Tank Conference, 2009 - 2011

#### Secretary of the Editorial Committee for the English Journal, the Society of Naval Architects of Korea, 2008 - 2011 (대한조선학회 영문편집위원회 간사, 2008 - 2011)

#### Member of the Advisory Committee for the Yacht Industry, Gyeongnam, Korea, 2008 - 2010 (경상남도 요트산업 자문위원, 2008 - 2010)

#### Secretariat of the Local Organizing Committee for the 27th Symposium on Naval Hydrodynamics, 2008

#### Faculty Adviser for the Seoul National University Sailing Club, 2007 - Present (서울대학교 요트부 지도교수, 2007 - 현재)

#### Member of the Technical Review Committee for the 9th International Conference on Numerical Ship Hydrodynamics, 2006

#### Student Mentor for Society of Naval Architects and Marine Engineers, 2006

#### Member of American Institute of Aeronautics and Astronautics, 2003 - 2004, 2009 - 2011.

#### Member of Society of Naval Architects and Marine Engineers, 2001 - Present

#### Member of Japan Society of Naval Architects and Ocean Engineers, 2000 – 2022

#### Member of American Society of Mechanical Engineers, 1998 - Present

#### Member of the Local Organizing Committee for the 25th American Towing Tank Conference, Iowa City, Iowa, 1998

#### Member of Korean-American Scientists and Engineers Association, 1993 - 1997

#### President of Seoul National University Sailing Club, 1987 - 1988

# Awards

#### 2024 한국해양과학기술협의회 공동학술대회 우수논문 발표상(Paper Presentation Award, 2024 Joint Conference of the Korean Society of Ocean Science and Technology Societies), May 2024

#### 2024 함정기술∙무기체계 세미나 우수논문상 (Excellent Paper Award, 2024 of Naval Ship Technology & Weapon System seminar), April 2024

#### 이병호 우수강의상, 서울대학교 공과대학 (Byoungho Lee Teaching Award, College of Engineering, Seoul National University), October 2023

#### 해양수산부장관 감사장 (Certificate of Appreciation, The Ministry of Oceans and Fisheries, The Government of the Republic of Korea), August 2023

#### 2023 한국해양과학기술협의회 공동학술대회 우수논문 발표상(Paper Presentation Award, 2023 Joint Conference of the Korean Society of Ocean Science and Technology Societies), May 2023

#### 대한조선학회 2022 정기총회 및 추계학술대회 논문상 (Paper Award, Autumn Meeting 2022 of the Society of Naval Architects of Korea), November 2022

#### 한국전산유체공학회 2021 추계학술대회 KISTI 고성능수치해석상(KISTI High-Performance Numerical Analysis Award, Autumn Meeting 2021 of the Korean Society for Computational Fluids Engineering), October 2021

#### 한국해군과학기술학회 2020 추계학술대회 우수논문상 (Excellent Paper Award, Autumn Meeting 2020 of the Korean Society for Naval Science & Technology), November 2020.

#### 한국전산유체공학회 2018년 춘계학술대회 우수발표논문상 (Excellent Presentation Award, Spring Meeting 2018 of the Korean Society for Computational Fluids Engineering), November 2018.

#### 대한기계학회 근속 공로상 (Outstanding Service Award, Journal of Mechanical Science and Technology), July 2017.

#### 제10회 조선해양의 날 산업통상자원부장관 표창 (Minister Award, Ministry of Trade, Industry and Energy), September 2013.

#### 한국풍력에너지학회 2013년 춘계학술대회 우수논문상 (Excellent Paper Award, Spring Meeting 2013 of the Korea Wind Energy Association), June 2013.

#### 제 8회 서울대학교 공과대학 신양공학학술상 (Sinyang Engineering Faculty Award, College of Engineering, Seoul National University), December 2012.

#### 과학기술단체 총연합회 제22회 과학기술 우수논문상 (Excellent Paper Award, the Korean Federation of Science and Technology Societies), July 2012.

#### 제26회 서울특별시장배 요트경기대회 국제 호비16급 일반부 3위 (3rd place, International Hobie 16 class, 26th Seoul Mayor’s Cup Yacht Race), May 2011.

#### 한국해양환경공학회 우수논문상 (Excellent Paper Award, Korea Society of Marine Environmental Engineering), November 2009.

#### 서울대학교 공과대학 우수연구 교수상 (Excellent Research Professor Award, College of Engineering, Seoul National University), March 2008.

# International Peer - Reviewed Journals Served as Technical Reviewer

#### Advanced Shipping and Ocean Engineering

#### Advances in Mechanical Engineering

#### Advances in Tribology

#### AIAA Journal

#### Applied Energy

#### Applied Ocean Research

#### ASME Journal of Fluids Engineering

#### Computer Methods in Applied Mechanics and Engineering

#### Computers and Fluids

#### Energies

#### Energy Conversion and Management

#### Engineering Applications of Computational Fluid Mechanics

#### Experimental Thermal and Fluid Science

#### Heliyon

#### International Journal of Engineering and Technology Innovation

#### International Journal of Heat and Mass Transfer

#### International Journal of Rotating Machinery

#### International Journal of Technology

#### International Journal of Thermal Sciences

#### Journal of Fluid Mechanics

#### Journal of Fluids

#### Journal of Marine Science and Application

#### Journal of Marine Science and Engineering

#### Journal of Marine Science and Technology

#### Journal of Mechanical Science and Technology

#### Journal of Ocean Technology

#### Journal of Ocean University of China

#### Journal of Ship Research

#### Journal of Zhejiang University - Science A

#### Mathematical Problems in Engineering

#### Ocean Dynamics

#### Ocean Engineering

#### Physics of Fluids

#### Renewable Energy

#### Science China Technological Sciences

#### Scientia Iranica

#### Scientific Reports

#### Ships and Offshore Structures

# Special Training/Certificates

#### TEPS (Test of English Proficiency developed by SNU), Level 1, 2015

#### 요트경기 국가심판 자격증, 대한요트협회 (National Judge License - Sailing, Korea Sailing Federation), 2013

#### 세일링 지도자 3급 자격증 - 딩기 & 킬보트, 국민생활체육전국요트연합회 (Sailing Instructor License - 3rd Level, Korea Yacht Association of Sport for All), 2013

#### Sandler’s Professional Advantage, Sandler Sales Institute, 2005

#### Avoiding Grammatical Errors in Business Writing, SmartForce, SkillSoft, 2003

#### Managing Time, SmartForce, SkillSoft, 2003

#### Delegation Basics, SmartForce, SkillSoft, 2003

#### AIAA Professional Development Short Course: Stability and Transition: Theory, Modeling, and Application, June 2003

#### Project Management: Fundamentals, SmartForce, SkillSoft, 2003

#### ANSI C Programming: Introducing C, SmartForce, SkillSoft, 2002

#### Cardiopulmonary Resuscitation (CPR) Training for Family and Friends, American Heart Association, June 2002

#### Cornell Theory Center Virtual Workshop: Introduction to Parallel Computing and Programming Languages, January - February 1999

#### Cornell Theory Center Virtual Workshop: Serial and Parallel Performance Issues, May - June 1998

# Languages

Proficient in speaking and writing in English, Japanese, and Korean

# Sponsored Research

#### Analysis of initial behavior of an underwater ejecting vehicle (수중 공압사출 운동체의 초기 거동해석), *funded by Lig Nex1 Co. Ltd,* 2025 – 2026, as Principal Investigator

#### Research on the Variation of Surrounding Flow around the Blade Tip Shape (단면 끝날 형상에 따른 주변 유동 변화 연구), *funded by HD Korea Shipbuilding and Offshore Engineering Co. Ltd*, 2024 – 2025, as Principal Investigator

#### Development of a seakeeping / maneuvering model for the simulation of the launch and recovery system of unmanned surface vehicles (무인수상정의 진∙회수 모사를 위한 내항/조종 운동모델 개발), *funded by Lig Nex1 Co. Ltd,* 2024 – 2027, as Principal Investigator

#### Design technology for seawater supply systems for ship hull cooling (함정 선체 냉각을 위한 해수 공급 시스템 설계 기술), *funded by Hanhwa Ocean Co., Ltd.*, 2024 - 2025, as Principal Investigator

#### Research on vehicle submersibility for mobility operations in diverse environments (다양한 환경에서의 모빌리티 운용을 위한 차체 수중거동 연구), *funded by Hyndai Motor Co. Ltd,* 2024 – 2025, as Principal Investigator

#### Development of Fundamental Technologies for Ship Energy Reduction (선박 에너지 저감을 위한 기반 기술 개발), *funded by HD Korea Shipbuilding and Offshore Engineering Co. Ltd*, 2023, as Principal Investigator

#### Exploratory research of pumpjet propulsion system (펌프젯 추진 시스템 탐색 연구), *funded by Daewoo Shipbuilding and Marine Engineering Co., Ltd.*, 2023 - 2024, as Principal Investigator

#### Development of propeller cavitation performance analysis module at stern wake using OpenFOAM (OpenFOAM을 이용한 선미 반류 중 프로펠러 캐비테이션 성능해석 모듈 개발), *funded by Daewoo Shipbuilding and Marine Engineering Co., Ltd.*, 2022 - 2023, as Principal Investigator

#### Towing body model towing experiment (예인운동체 모형 예인실험) *funded by LIG Nex1 Co., Ltd.*, 2022, as Principal Investigator

#### A study on the effect of reducing the flooding flow in the hull opening (선체 개구부 침수유량 감소효과 연구) *funded by Social Disaster Special Investigation Committee, 2021 - 2023, as Principal Investigator*

#### Development of towed body's attitude stabilization (예인운동체 자세 안정화 기술개발), *funded by LIG Nex1 Co., Ltd.*, 2021, as Principal Investigator

#### Research for the review of the possibility of building advanced naval vessels (21년 차세대 첨단함정 건조가능성 검토 연구용역(Ⅳ)), *funded by Republic of Korea Navy*, 2021, as Principal Investigator

#### Resistance/Self-propulsion/PMM tests of autonomous surface vehicle (무인수상정 저항/자항/PMM시험), *funded by the Agency for Defense Development*, 2021-2022, as Principal Investigator

#### Analysis of computational fluid dynamics for estimating the underwater vehicle's hydrodynamic force (수중운동체의 유체력 추정을 위한 전산유체역학 해석), *funded by the Agency for Defense Development*, 2021-2022, as Principal Investigator

#### Study on the turbulence stimulation mechanism for model testing and the effects of pressure gradient and freestream turbulence intensity (모형시험용 난류 촉진장치의 메커니즘과 그에 미치는 압력구배 및 난류 강도의 영향에 관한 연구), *funded by Ministry of Education*, 2020 - 2025, as Principal Investigator

#### Development of Propeller Cavitation Performance Analysis Module using OpenFOAM (OpenFOAM을 이용한 프로펠러 캐비테이션 성능 해석 모듈 개발), *funded by Daewoo Shipbuilding and Marine Engineering Co., Ltd.*, 2019 - 2020, as Principal Investigator

#### 추진기를 포함한 잠수체의 유체력 추정 코드 개발 (OpenFOAM), *funded by Daewoo Shipbuilding and Marine Engineering Co., Ltd.*, 2019 - 2020, as Principal Investigator

#### Development of Open Source CFD Solver for the Virtual Captive Model Test (가상구속모형시험 오픈소스 CFD 솔버 개발), *funded by Samsung Heavy Industries*, 2019, as Principal Investigator

#### Analyzing Towing Tank Model Test Results and Seakeeping Performance of High Speed Amphibious Armored Vehicle System (고속수륙양용체계 축소모델 수조시험 및 해상운행성 분석), *funded by the Agency for Defense Development*, 2019 - 2021, as Principal Investigator

#### Evaluation of Propeller Shaft Force Characteristics in Off-desing Condition (Off-design 조건에서의 프로펠러 축기진력 특성 평가), *funded by Hyundai Heavy Industries*, 2019 - 2020, as Principal Investigator

#### Computational Fluid Dynamics Analysis and Towing Tank Tests for the Propulsive Performance of a Submarine Model (모의 잠수함 저항 자항성능 전산유체해석 및 모형시험), *funded by the Agency for Defense Development*, 2018 - 2019, as Principal Investigator

#### Study on the Maneuverability of an AUV for Docking by Towing Tank Model (수조 모형 시험을 통한 도킹용 무인잠수정 조종 성능 해석 위탁연구), *funded by Hanwha Corporation*, 2018 - 2019, as Principal Investigator

#### Study on the Maneuvering Mathematical Modeling of a Dynamic Simulation Software for the Propulsion System of Naval Vessels (함정 추진체계 동적 시뮬레이션 SW용 함정 수학모델에 관한 연구), *funded by the Agency for Defense Development*, 2018 - 2019, as Principal Investigator

#### Towing Tank Model Tests for Assessing the Stability of MMB (MMB 성능 및 안전성 평가 시뮬레이션을 위한 수조모형시험), *funded by Korea Electric Power Corporation*, 2018 - 2019, as Principal Investigator

#### Development of a strategy for optimal power production from a 100kW class Horizontal Axis Tidal Stream Turbine System (100kW급 수평축 조류발전 터빈운용의 최적화 기법개발), *funded by National Research Foundation of Korea*, 2017-2020, as a Principal Investigator

#### Analyzing Towing Tank Model Test Results and Manufacturing Scaled Models of Amphibious Armored Vehicle System (수륙양용체계 축소모델 제작 및 수조 시험/분석), *funded by the Agency for Defense Development*, 2017 - 2018, as Principal Investigator

#### Development of Fluid Performance Analysis and Motion Control Technology (무인선 유체성능 해석 및 자세 제어 기술 개발), *funded by Ministry of Oceans and Fisheries*, 2017 - 2018, as Principal Investigator

#### Automatic Clean up Technology for 3 Dimensional CAD Geometry (3차원 CAD 형상 clean up 자동화 기술), *funded by Small and Medium Business Administration*, 2017 - 2017, as Principal Investigator

#### Study of Damaged Ship Maneuverability Based on Towing Tank Tests and Mathematical Maneuvering Models, *Naval International Cooperative Opportunities in Science and Technology (NICOP) funded by the Office of Naval Research, US Navy*, 2016 - 2019, as Principal Investigator

#### Development of Surplus Hydro Power Harvesting and Monitoring Platform in Water Piping System (수배관 미활용 에너지를 활용한 전력 생산 및 제어관리 시스템 개발), *funded by Ministry of Trade, Industry and Energy*, 2016 - 2019, as Principal Investigator

#### Analysis Methodology for Free Running of Damage Ship Maneuverability Using Computational Fluid Dynamics (전산유체역학을 이용한 자유항주 중인 손상 선박의 조종 성능 해석), *funded by the Ministry of Science, ICT and Future Planning*, 2016 - 2019, as Principal Investigator

#### Development and Validation of High-Fidelity Flow Simulation around Vessels (고충실도 함정 주위 유동시뮬레이션 및 검증 기술 개발), *funded by National Research Council of Science & Technology*, 2016 - 2019, as a Principal Investigator

#### CFD Analysis for Exploratory Development of KSS-III Batch-II (장보고 - III Batch - II 탐색개발 CFD 해석), *funded by Daewoo Shipbuilding and Marine Engineering Co., Ltd.*, 2016 - 2017, as Principal Investigator

#### Advanced Naval Vessels Research Laboratory(Level 2)/ Research for Estimating method of Resistance and Noise for Advanced Naval Vessels (차세대 함정 첨단 함형 특화연구실(2단계)/저자항 미래 함정의 저항 및 소음 예측 기법 연구), *funded by the Ministry of National Defense*, 2015 - 2017, as Principal Investigator

#### Development of Numerical Simulator for Environmental Load on Ship and Offshore in Polar Region (극지환경 선박 및 해양플랜트용 환경하중해석 시뮬레이터 개발), *funded by the Ministry of Trade, Industry and Energy*, 2015 - 2018, as Principal Investigator

#### Hydrodynamic Forces and Cavity Characteristics of a Supercavitating Underwater Vehicle with Control Plane (초공동 상태의 운동체/제어판 작용 유체력 및 공동 특성 연구), *funded by the Ministry of National Defense*, 2014 - 2017, as Principal Investigator

#### Analysis Methodology for Free Running of Damage Ship Stability Using Computational Fluid Dynamics (전산유체역학을 이용한 자유항주 중인 손상상태 선박의 안정성 해석), *funded by the Ministry of Science, ICT, and Future Planning*, 2013 - 2016, as Principal Investigator

#### Experimental study on Safe-Return-To-Port of a Damaged Ship for CFD validation (CFD 검증을 위한 손상상태 선박의 안전귀항에 관한 실험적 연구), *Naval International Cooperative Opportunities in Science and Technology (NICOP) funded by the Office of Naval Research, US Navy*, 2013 - 2016, as Principal Investigator

#### EEDI Verification Through Model Test Procedures and CFD Simulations, *funded by American Bureau of Shipping*, 2013, as Principal Investigator

#### Advanced Naval Vessels Research Laboratory (차세대 함정 첨단함형 특화연구실), *funded by the Ministry of Defense*, 2012 - 2017

#### Performance Test of Unmanned High Speed Vehicle (무인선 고속유체 성능시험), *funded by the Ministry of Land, Transport, and Maritime Affairs*, 2012 - 2016, as Principal Investigator

#### Development 50-kt class high-speed craft hull form and powering estimation formula through towing tank experiments (50노트급 고속정 선형 개발 및 모형 시험을 통한 마력 계산방법 연구), *funded by the Ministry of Defense*, 2012, as Principal Investigator

#### Development and utilization of fluid dynamic simulation software for naval architecture and ocean engineering education and research (조선해양 교육 및 연구를 위한 시뮬레이션 소프트웨어 개발 및 활용 연구), *funded by the Ministry of Education, Science, and Technology*, 2011 - 2015, as Principal Investigator

#### Development of multi-phase flow simulation program for the design of high value-added ships (고부가가치 선박 설계를 위한 다상유동 시뮬레이션 프로그램 개발), *funded by Small and Medium Business Administration*, 2011 - 2012, as Principal Investigator

#### Development and application of a flow analysis program based on the open source CFD code, OpenFOAM (소스 공개 CFD 코드 OpenFOAM을 기반으로 한 선체 및 프로펠러 주위 유동해석 프로그램 개발 및 적용), *funded by Hyundai Heavy Industries*, 2011 - 2012, as Principal Investigator

#### Measurement of the local flow around the propeller and rudder using towed two-dimensional particle image velocimetry (예인수조용 2차원 입자영상유속계를 이용한 프로펠러 및 타 주위 국부유동 계측), *funded by Samsung Heavy Industries*, 2011, as Principal Investigator

#### Research and development for simulation platform for applications of new FRP manufacturing techniques including infusion and RTM (인퓨전, RTM 등 FRP 신공법 적용을 위한 시뮬레이션 기반구축에 관한 연구개발), *funded by the Ministry of Knowledge Economy*, 2010 - 2011

#### Study of Damaged Ship Stability - 6DOF FSI Experimental Database (선박의 손상상태 안정성 연구 - 6자유도 FSI 실험 데이터베이스 구축), *funded by the Ministry of Education, Science, and Technology*, 2010 - 2012, as Principal Investigator

#### Floating Oscillating Type Wave Energy Power Generation Technology Development and Verification (부유식 진자형 파력발전 기술개발 및 실증), *funded by the Ministry of Land, Transport and Maritime Affairs*, 2010 - 2013

#### Development of multi-functional 5-axis milling station for production of the full-scale leisure boat (레저 선박 제작용 초대형 다기능 5축 삭성기 개발), *funded by the Ministry of Knowledge Economy*, 2009 - 2012

#### Development of a performance analysis method for the yacht sail system using fluid-structure interaction technology (유체-구조 연성해석에 의한 복합형 요트 세일의 성능해석법 개발), *funded by the Ministry of Education, Science, and Technology*, 2009 - 2012

#### Study of analysis technique for 6DOF motion (6DOF 해석 기술), *M3CFD Research Center funded by the Ministry of Education, Science, and Technology*, 2009 - 2016

#### Study on the cavitator design and analysis of super-cavitating underwater vehicle (초공동 발생 캐비테이터 설계/해석에 관한 연구), *Super-Cavitating Underwater Vehicle Research Center funded by the Agency of Defense Development*, 2009 - 2014

#### Experimental study of damaged ship stability for CFD validation (CFD 검증을 위한 손상상태 안정성에 관한 실험적 연구), *Naval International Cooperative Opportunities in Science and Technology (NICOP) funded by the Office of Naval Research, US Navy*, 2009 - 2012, as Principal Investigator

#### Technology development of propeller and rudder for a ship with low vibration and high efficiency (저진동-고효율 추진기 및 방향타 개발 기술), *funded by the Ministry of Knowledge Economy*, 2009 - 2011

#### Development of standardized S/W system for the integrated design of tidal current turbines (조류발전용 터빈 통합설계용 표준화 S/W 시스템 개발), *funded by the Ministry of Knowledge Economy*, 2009 - 2012

#### Tidal stream energy conversion turbine performance analysis (조류발전 터빈 성능해석), *Tidal Stream Energy Research Center funded by the Ministry of Knowledge Economy*, 2009 - 2012

#### Development of the model-scale effective wake prediction and its extension to full-scale (모형선 스케일에서의 유효반류분포 예측방법 개발 및 실선 스케일로의 확장방법 연구), *funded by Hyundai Heavy Industries*, 2009 - 2011, as Principal Investigator

#### Robust design of multi-physics problems in marine engineering (조선해양공학에서 다중물리문제의 강건설계), *World Class University project funded by the Ministry of Education, Science, and Technology*, 2008 - 2013, as Principal Investigator

#### Study on the design technology of hydro-elastic propulsors made of composite materials (탄성변형을 고려한 복합재 추진기 설계기법 연구), *funded by Defense Acquisition Program Administration*, 2008 - 2012

#### Experimental study on the resistance performance enhancement through anti-sinkage appendages (선체부가물을 이용한 연료 저감장치 연구), *funded by STX Shipbuilding*, 2008 - 2009, as Principal Investigator

#### 차기 군수지원함사업 개념 설계 기술지원 용역, *funded by Defense Acquisition Program Administration*, 2008, as Principal Investigator

#### 함정 기본설계 업체선정 평가기준 연구용역, *funded by Defense Acquisition Program Administration*, 2008, as Principal Investigator

#### Development and validation of ship self-propulsion simulator (선박의 자항성능 추정을 위한 시뮬레이터의 개발 및 검증), *funded by Korea Science and Engineering Foundation*, 2008 - 2010, as Principal Investigator

#### Leak simulation in the LNG carrier cargo containment system using CFD (CFD를 이용한 LNG선 화물창의 방벽 내 Leak Simulation), *funded by Samsung Heavy Industries*, 2008, as Principal Investigator

#### Hull form development and performance evaluation of cruise ships with podded propulsors (POD 추진기 장착 크루즈선의 선형개발 및 성능평가 기술개발), *funded by Daewoo Shipbuilding and Marine Engineering*, 2008 - 2010, as Principal Investigator

#### Local sloshing impact analysis for LNG tank walls using CFD-FEA coupled tools (CFD-FEA 연계 툴을 이용한 LNG 탱크 슬로싱 국소 충격력 해석), *funded by Lloyd’s Register Educational Trust (LRET) through LRET Research Center at Seoul National University*, 2008 - 2010, as Principal Investigator

#### Study of Fundamental Aspects of Damaged Stability of Ships - Understanding of Water-on-Deck Events (선박의 손상상태 안전성 향상을 위한 기초연구 - 갑판침수현상의 이해), *funded by Korea Research Foundation*, 2007 - 2008, as Principal Investigator

#### Development of high-lift control devices for ships (선박용 고양력 날개장치의 성능검증 및 최적향상 도출), *funded by Korea Science & Engineering Foundation through Ship Flow Control Lab at Inha University*, 2007 - 2012

#### Hydrodynamic analysis tool development for under-water vehicles (수중함의조종성능해석), *funded by Daewoo Shipbuilding & Marine Engineering Co., Ltd.*, 2006 - 2008

#### Architectural Concepts & Hydrodynamics Technologies for High Speed Sealift to Austere Port, Subtask B: Computational Approach and Hydrodynamics Tools, *funded by the Office of Naval Research*, 2005 - 2007

#### Computational hydrodynamics CFD code development for surface ship boundary layer, wake, and wave field, *funded by the Office of Naval Research*, 1992 - 1999

# Patents Registered

## International Patents

##### System for Removing Floating Waste and Method for Removing Floating Waste Using the Same System), 발명자: **이신형**, 유성근, 권귀감, 임유진, 최우영, 최재혁, 유극상 (**S.H. Rhee**, S.G. Yoo, G.G. Kwon, Y.J. Im, W.Y. Choi, J.H. Choi, G.S.Yoo), Registered US patent(US-9,695,564 B2), July 4, 2017.

## Domestic Patents

##### 코안다 효과를 활용한 와류 고리 추진기 및 이의 추진 성능 평가 방법, 발명자: 허영민, **이신형**, 석우찬, 서인덕, 이인수 (Y. Heo, **S.H. Rhee**, W. Seok, I. Suh, I. Lee), 출원번호 10-2021-0141276, 등록번호 10-2589128, Pending Korea patent (10-2589128), October 21, 2021.

##### 수중 항주체 성능시험 장치, 발명자: 최두환, 조희상, 유성선, 이필엽, 김호성, 윤현규, **이신형**, 서정화, 박종열 (D.H. Choi, H.S. Cho, S.S. Yoo, P.Y. Yoo, H.S. Kim, H.K. Yoon, **S.H. Rhee**, J.H. Seo, J. Park), 출원번호 10-2018-0170066, 등록번호 10-1989316, Resistered Korea patent (10-1989316), June 10, 2019.

##### 부유쓰레기 처리시스템 및 이를 활용한 쓰레기 처리 방법 (Drone Type Device System and Method for Cleaning Floating Pollutant), 발명자: **이신형**, 유성근, 권귀감, 임유진, 최우영, 최재혁 (**S.H. Rhee**, S.G. Yoo, G.G. Kwon, Y.J. Im, W.Y. Choi, J.H. Choi), 출원번호 10-2015-0040001, 등록번호 10-2016-0113823, Registered Korea patent (10-0113823), October 4, 2016.

##### 예인용 후방 난류발생 저감장치 (Rear Vortex Reducing Device for Towing), 발명자: 박창욱, **이신형**, 서정화, 정병진, 나경웅 (C.W. Park, **S.H. Rhee**, J.H. Seo, B.J. Jung, G.U. Na), 출원번호 10-2015-0054511, 등록번호 10-1665002, Registered Korea patent (10-1665002), October 11, 2016.

##### 레이저를 이용한 예인수조 레일용 계측장치 및 이에 의한 계측방법 (Measuring Apparatus for Rail of Towing Tank using Laser and Measuring Method Thereof), 발명자: **이신형**, 서정화, 유극상 (**S.H. Rhee**, J.H. Seo, G.S. Yoo), 출원번호 10-2014-0064510, 등록번호 10-1652365, Registered Korea patent (10-1652365), August 24, 2016.

##### 조류발전용 요제어 시험장치 (Test Apparatus for Yaw Controlling of a Tidal Stream Power Generation), 발명자: 고진환, 이광수, 김지훈, **이신형**, 서정화, 이용국, 최두환(J.H. Ko, K.S. Lee, J.H. Kim, **S.H. Rhee**, J.H. Seo, Y.K. Lee, D.H. Choi), 출원번호 10-2013-0137941, 등록번호 10-1493258, Registered Korea patent (10-1493258), February 9, 2015.

##### 플랩타입의 조류발전장치 및 그 운용방법 (Generating Apparatus for Flap Type Current Turbine and Operation Method of Same), 발명자: **이신형**, 서정화, 임태구, 유극상, 김창희, 이희범, 박미연(**S.H. Rhee**, J.H. Seo, T.G. Lim, G.S. Yoo, C.H. Kim, H.B. Lee, M.Y. Park), 출원번호 10-2013-0167591, 등록번호 10-1489177, Registered Korea patent (10-1489177), January 28, 2015.

##### 수평축 조류 발전 터빈, 이의 제조 방법 및 이를 이용한 조류 발전 방법 (Horizontal Axis Tidal Current Power Turbine, Manufacturing Method and Power Generation Method), 발명자: 박성우, 박세완, 서정화, 설동명, 유극상, 유동현, **이신형**, 임진호, 정태종, 차상현 (S.W. Park, S.W. Park, J.H. Seo, D.M. Seol, G.S. Yoo, D.H. You, **S.H. Rhee**, J.H. Lim, T.J. Jung, S.H. Cha), 출원번호 10-2012-0055952, 등록번호 10-1335336, Registered Korea patent (10-1335337), November 26, 2013.

##### 가변면적 조류 발전 터빈, 이의 제조 방법 및 이를 이용한 조류 발전 방법 (Controllable Projected Area Tidal Current Power Turbine, Manufacturing Method and Power Generation Method), 발명자: 미르, 박세완, 백강민, 서정화, 설동명, 유극상, **이신형**, 정동욱, 정태종, 최재복 (Mir, S.W. Park, G.M. Baek, J.H. Seo, D.M. Seol, G.S. Yoo, **S.H. Rhee**, D.W. Jung, T.J. Jung, J.B. Choi), 출원번호 10-2012-0055940, 등록번호 10-1335337, Registered Korea patent (10-1335337), November 26, 2013.

##### 예인전차용 레일 교정 장치 및 방법 (Rail Correction Apparatus and Method for Towing Tank), 발명자: **이신형**, 유극상, 정태종, 설동명, 서정화 (**S.H. Rhee**, G.S. Yoo, T.J. Jeong, D.M. Seol, J.H. Seo), 출원번호 10-2012-055986, 등록번호 10-1326499, Registered Korea patent (10-1326499), November 1, 2013.

##### 조류발전 터빈의 모형실험 시스템 (Model Test System for Tidal Stream Turbine), 발명자: **이신형**, 유극상, 정태종, 설동명, 서정화, 유지명 (**S.H. Rhee**, G.S. Yoo, T.J. Jeong, D.M. Seol, J.H. Seo, J.M. Yoo), 출원번호 10-2011-0023332, 등록번호 10-1301241, Registered Korea patent (10-1301241), August 22, 2013.

##### 예인수조용 쇄파 장치 및 방법 (Wave Absorbing Apparatus and Method for Towing Tank), 발명자: **이신형**, 유극상, 정태종, 설동명, 서정화 (**S.H. Rhee**, G.S. Yoo, T.J. Jeong, D.M. Seol, J.H. Seo), 출원번호 10-2012-0056405, 등록번호 10-1280861, Registered Korea patent (10-1280861), June 26, 2013.

##### 손상선박의 안정성 해석을 위한 모형선 시스템 및 그 모형선의 거동 관찰방법 (A Model Ship System for Safety Analysis of Damaged Ship and the Method for Motion Probing the Damaged Model Ship), 발명자: **이신형**, 이성균, 유지명, 이기표, 이현호, 유극상, 정태종, 설동명, 서정화(**S.H. Rhee**, S.K. Lee, J.M. Yoo, K.P. Rhee, H.H. Lee, G.S. Yoo, T.J. Jeong, D.M. Seol, J.H. Seo), 출원번호 10-2011-0084949, 등록번호 10-1261264, Registered Korea patent (10-1261264), Apr. 30, 2013.

##### 고효율 저소음 조류발전용 터빈 블레이드 (High Efficiency and Low Noise Tidal Blade of Turbine for Tidal Stream Power), 발명자: 김문찬, **이신형**, 현범수, 남종호, 신병철, 이주현, 도인록 (M.C. Kim, **S.H. Rhee**, B.S. Hyun, J.H. Nam, B.C. Shin, J.H. Lee and I.R. Do), 출원번호 10-2010-0052124, 등록번호 10-1213781, Registered Korea patent (10-1213781), December 12, 2012.

##### 예인수조용 입자영상유속계 시스템 (Towed Particle Image Velocimetry System), 발명자: **이신형**, 유극상, 설동명, 서정화(**S.H. Rhee**, G.S. Yoo, D.M. Seol, J.H. Seo), 출원번호 10-2010-0084879, 등록번호 10-1216706 Registered Korea patent (10-1216706), December 21, 2012.

##### 예인수조용 입자영상유속계의 추적입자 살포장치 (Tracer Particle Spraying Apparatus for Particle Image Velocimetry in Towing Tank), 발명자: **이신형**, 유극상, 설동명, 서정화 (**S.H. Rhee**, G.S.Yoo, D.M.Seol, J.H. Seo), 출원번호 2011-0013384, 등록번호 10-1205172 Registered Korea patent (10-1205172), November 20, 2012.

##### 컴퓨터를 이용한 선박설계 방법 (Computational Method for Ship Hull Design), 발명자: **이신형**, 서정화, 최정은 (**S.H. Rhee**, J.H. Seo, J.E. Choi), 출원번호 10-2010-0053287, 등록번호 10-1165018 Registered Korea patent (10-1165018), July 25, 2012.

##### 이중차단 틈새 유동차단기가 고정부와 가동부 사이에 설치된 선박용 타 장치 장치 (Ships Rudder with Double Acting Gap Flow Stopper between Fixed and Movable Part), 발명자: 김효철, 유재문, 오정근, **이신형**, 서정천 (H. Kim, J.M. Lew, J.K. Oh, **S.H. Rhee**, and J.C. Suh), 출원번호 10-2006-0054006, 등록번호 10-0735724, Registered Korea patent (10-0735724), June 28, 2007.

##### 혼과 타판 사이에 틈새 유동차단장치가 설치된 타 장치 (Rudder of a Ship with Gap Flow Stopper between Horn and Rudder), 발명자: 김효철, 서정천, **이신형**, 양지만 (H. Kim, J.C. Suh, **S.H. Rhee**, and J.M. Yang), 출원번호 10-2005-0040256, 등록번호 10-605125, Registered Korea patent(10-605125), July 19, 2006.

# Software Programs

#### SNUFOAM-Vertical Axis Turbine, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 여홍구, 신소용, 석우찬, **이신형** (H. Yeo, S. Shin, W. Seok and **S.H. Rhee**), 등록번호 C-2019-010909, Software registered with Korea Copyright Commission (C-2019-010909), April 2019.

#### SNUFOAM-ventilatedCav(DyM), 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 박성택, **이신형** (S.T. Park and **S.H. Rhee**), 등록번호 C-2017-023037, Software registered with Korea Copyright Commission (C-2017-023037), September 2017.

#### SNUFOAM-EDISON-Ship Mesh Advanced-3D, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 최학규, **이신형** (H.K. Choi and **S.H. Rhee**), 등록번호 C-2016-012119, Software registered with Korea Copyright Commission (C-2016-012119), May 2016.

#### SNUFOAM-EDISON-EDISON-Ship Resistance with free-surface, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 최학규, **이신형** (H.K. Choi and **S.H. Rhee**), 등록번호 C-2016-012118, Software registered with Korea Copyright Commission (C-2016-012118), May 2016.

#### SNUFOAM-EDISON-EDISON-POW Advanced-3D, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 최학규, **이신형** (H.K. Choi and **S.H. Rhee**), 등록번호 C-2016-012117, Software registered with Korea Copyright Commission (C-2016-012117), May 2016.

#### SNUFOAM-EDISON-dynamicMesh for underwater vehicle, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.B. Lee and **S.H. Rhee**), 등록번호 C-2015-024811, Software registered with Korea Copyright Commission (C-2015-024811), October 2015.

#### SNUFOAM-EDISON-Container Ship Resistance Package, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.B. Lee and **S.H. Rhee**), 등록번호 C-2015-016734, Software registered with Korea Copyright Commission (C-2015-016734), July 2015.

#### SNUFOAM-EDISON-POW, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.B. Lee and **S.H. Rhee**), 등록번호 C-2015-015788, Software registered with Korea Copyright Commission (C-2015-015788), July 2015.

#### SNUFOAM-EDISON-Cavitation-2D, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.B. Lee and **S.H. Rhee**), 등록번호 C-2014-013968, Software registered with Korea Copyright Commission (C-2014-013968), June 2014.

#### SNUFOAM-EDISON-Cavitation-3D, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.B. Lee and **S.H. Rhee**), 등록번호 C-2014-013959, Software registered with Korea Copyright Commission (C-2014-013959), June 2014.

#### SNUFOAM-EDISON-VOF-2D, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.Lee and **S.H. Rhee**), 등록번호 C-2013-012059, Software registered with Korea Copyright Commission (C-2013-012059), June 2013.

#### SNUFOAM-EDISON-WAVE-2D, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.Lee and **S.H. Rhee**), 등록번호 C-2013-012060, Software registered with Korea Copyright Commission (C-2013-012060), June 2013.

#### SNUFOAM-EDISON-Laminar-2D, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.Lee and **S.H. Rhee**), 등록번호 C-2012-015409, Software registered with Korea Copyright Commission (C-2012-015409), August 2012.

#### SNUFOAM-EDISON-Laminar-Axis, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.Lee and **S.H. Rhee**), 등록번호 C-2012-015410, Software registered with Korea Copyright Commission (C-2012-015410), August 2012.

#### SNUFOAM-EDISON-Turbulent-2D, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.Lee and **S.H. Rhee**), 등록번호 C-2012-015411, Software registered with Korea Copyright Commission (C-2012-015411), August 2012.

#### SNUFOAM-EDISON-Turbulent-Axis, 저작자: 서울대학교 산학협력단 (SNU R&DB Foundation), 참여자: 이희범, **이신형** (H.Lee and **S.H. Rhee**), 등록번호 C-2012-015412, Software registered with Korea Copyright Commission (C-2012-015412), August 2012.

#### SNUFOAM-CompressibleFlow, 저작자: 박선호, **이신형** (S. Park and **S.H. Rhee**), 등록번호 2011-01-179-002913, Software registered with Korea Copyright Commission (2011-01-179-002913), May 2011.

#### BEMT(Blade Element Momentum Theory)를 이용한 수평축 조류발전 터빈 성능해석 프로그램 (Performance Analysis Program for Horizontal Axis Tidal Stream Turbines using BEMT), 저작자: **이신형**, 이주현, 김동환 (**S.H. Rhee**, J.H.Lee, and D.H.Kim), 등록번호 2010-01-181-007940, Software registered with Korea Copyright Commission (2010-01-181-007940), December 2010.

#### SNUFOAM-6DOF, 저작자: 박선호, **이신형** (S. Park and **S.H. Rhee**), 등록번호 2010-01-179-005890, Software registered with Korea Copyright Commission (2010-01-179-005890), October 2010.

#### SNUFOAM-MeshMotion, 저작자: 박선호, **이신형** (S. Park and **S.H. Rhee**), 등록번호 2010-01-179-005889, Software registered with Korea Copyright Commission (2010-01-179-005889), October 2010.

#### SNUFOAM-SRF, 저작자: 박선호, **이신형** (S. Park and **S.H. Rhee**), 등록번호 2010-01-179-005888, Software registered with Korea Copyright Commission (2010-01-179-005888), October 2010.

#### SNUFOAM-Cavitation, 저작자: 박선호, **이신형** (S. Park and **S.H. Rhee**), 등록번호 2010-01-179-005887, Software registered with Korea Copyright Commission (2010-01-179-005887), October 2010.

#### 초기 선형 설계를 위한 자동화 툴 (Automation tool for initial hull form design), 저작자: 이주현, **이신형** (J.H. Lee and **S.H. Rhee**), 등록번호 2010-01-121-004015, Software registered with Korea Copyright Commission (2010-01-121-004015), July 2010.

# Graduate Students Supervised

## Doctor of Philosophy

###### Jongyeol Park

* Thesis Title: 난류촉진장치가 평판 경계층과 천이에 미치는 영향 (Effects of Turbulence Stimulators on Boundary Layer Transition over a Flat Plate)
* Year Degree Conferred: 2022
* Current Affiliation: Changwon National University

###### Dae Han Lee

* Thesis Title: 수륙양용체계의 파랑 중 수직면 자세 제어 및 동역학 모델 식별 (Vertical Motion Control in Waves and Dynamics Model Identification of an Amphibious Vehicle)
* Year Degree Conferred: 2022
* Current Affiliation: Defense Acquisition and Procurement Agency

###### Seok Cheon Go

* Thesis Title: 원호를 따라 등속도로 이동하는 구의 입수 현상 (Water entry of a sphere moving along a circular path at constant speed)
* Year Degree Conferred: 2021
* Current Affiliation: Hyundai Heavy Industries Co., Ltd.

###### Woochan Seok

* Thesis Title: 고 레이놀즈 수 난류 2차 흐름모사를 위한 PANS 모델 개선 (An improved partially-averaged Navier-Stokes model for turbulent secondary flow at high Reynolds number)
* Year Degree Conferred: 2020
* Current Affiliation: Pukyong National University

###### Daehyuk Kim

* Thesis Title: 손상 수상함의 조종성능 특성 연구 (A study on the maneuvering characteristics for a damaged surface combatant ship)
* Year Degree Conferred: 2018
* Current Affiliation: Seoul National University

###### Bumwoo Han

* Thesis Title: Propeller Boss Cap Fins의 설계요목 변화에 따른 허브 보오텍스 감소효과에 대한 실험적 연구 (Experimental Study on Hub Vortex Reducing Effect of Propeller Boss Cap Fins According to Variation of Design Parameters)
* Year Degree Conferred: 2017
* Current Affiliation: Hyundai Heavy Industries Co., Ltd.

###### Jeonghwa Seo

* Thesis Title: 자유수면이 수면관통물체 주위의 난류 경계층과 후류에 미치는 영향 (Free-Surface Effects on Turbulent Boundary Layer and Near-Wake Around a Surface-Piercing Body)
* Year Degree Conferred: 2016
* Current Affiliation: Professor, Chungnam National University

###### Heebum Lee

* Thesis Title: 파랑 중 선박의 6자유도 운동 해석을 위한 전산유체역학 기법 연구 -자유수면유동 및 부유체 운동을 중심으로- (A study of computational schemes for six degree-of-freedom motion of a ship in waves -Free-surface flow and floating body motion-)
* Year Degree Conferred: 2015
* Current Affiliation: Korea Hydro & Nuclear Power Co, Ltd.(KHNP)

###### Hyun-Ho Lee

* Thesis Title: 콘테이너 운반선의 선미 슬래밍 하중 추정에 대한 실험적 연구 (An experimental study on the prediction of stern slamming loads on containerships)
* Year Degree Conferred: 2013
* Current Affiliation: Hyundai Heavy Industries Co., Ltd.

###### Sunho Park

* Thesis Title: Development of practical method for prediction of cavitation erosion with turbulent flow using computational fluid dynamics: cavitation erosion prediction
* Year Degree Conferred: 2013
* Current Affiliation: Professor, Korea Maritime & Ocean University

###### Dong Myung Seol

* Thesis Title: 예인수조용 2차원 입자영상유속계를 이용한 유선형 수면관통 물체 후류의 난류유동 해석 (Turbulent flow measurements on the wake of a streamlined surface-piercing body using two-dimensional towed underwater PIV system)
* Year Degree Conferred: 2013
* Current Affiliation: Defense Acquisition and Procurement Agency

## Master of Science in Engineering

###### Hanjoon Kim

* Thesis Title: 펌프젯 추진기 단독성능 추정을 위한 CFD 코드 개발 (CFD Code Development for Open Water Performance Evaluation of a Pump-Jet Propulsor)
* Year Degree Conferred: 2024
* Current Affiliation: HD Korea Shipbuilding & Offshore Engineering Co

###### Jaeheon Kim

* Thesis Title: 수면 관통형 프로펠러의 실해상 작동조건을 고려한 추진 특성에 관한 연구 (A Study on the Propulsion Characteristics of Surface-Piercing Propellers Considering Actual Sea Operation Conditions)
* Year Degree Conferred: 2024
* Current Affliliation: Vogo Industries

###### Jaehun Kim

* Thesis Title: 보호가이드가 EM-Log 주위 유동에 미치는 영향에 관한 실험적 연구 (An Experimental Study on the Effects of a Protection Guide Affecting the Flow near the Electro-Magnetic Log (EM-Log))
* Year Degree Conferred: 2023
* Current Affiliation: Republic of Korea Navy

###### Insu Lee

* Thesis Title: 축 대칭 노즐에서의 캐비테이션 침식 추정을 위한 압력 기반 압축성 유동 솔버 개발 (Development of Pressure-Based Compressible Flow Solver for Estimation of Cavitation Erosion in the Axisymmetric Nozzles)
* Year Degree Conferred: 2022
* Current Affiliation: Seoul National University

###### Youngmin Heo

* Thesis Title: 코안다 와류 고리 추진기의 개발을 위한 유동 해석 (Flow Analysis for the Development of the Coanda Vortex Ring Thruster)
* Year Degree Conferred: 2022
* Current Affiliation: Hanwha Aerospace

###### Gyukpo Park

* Thesis Title: 사항각도에 따른 부분침수 프로펠러의 축계 하중 특성 연구 (A Study of Submerged Propeller Shat Load Characteristics for the Inflow angle)
* Year Degree Conferred: 2021
* Current Affiliation: Hyundai Heavy Industries Co., Ltd

###### Yongjae Cho

* Thesis Title: 프로펠러 작동 원판 기법 개선을 위한 근사 최적화 기법 적용 (Application of the approximate optimization method for improvement of actuator disk method representing a marine propeller)
* Year Degree Conferred: 2021
* Current Affiliation: RTsolutions.Inc

###### Taeil Lee

* Thesis Title: 손상 수상함의 조종성능 추정을 위한 자유항주모형시험법 연구 (A Study on Free-Running Model Test Method for Maneuverability Assessment of Damaged Surface Combatant)
* Year Degree Conferred: 2020
* Current Affiliation: Hiconsy

###### Hong-gu Yeo

* Thesis Title: 배관 내부에서 작동하는 수직축 터빈의 설계 변수에 따른 효율 변화 및 발전량 증대 방안에 관한 연구 (A Study on the Performance and Improvement of Power Generation for Vertical Axis Turbine in a Water Pipe)
* Year Degree Conferred: 2020
* Current Affiliation: Hyundai Heavy Industries Co., Ltd.

###### Hoe-Sung Jeong

* Thesis Title: 워터젯 추진 상륙돌격장갑차의 실험 성능 추정법 개발 (Development of Experimental Method for Powering Prediction of a Waterjet-Propelled Amphibious Armored Vehicle)
* Year Degree Conferred: 2019
* Current Affiliation: Defense Acquisition and Procurement Agency

###### Ki-Hyun Cheon

* Thesis Title: 가상구속모형시험을 통한 X-형 선미 제어판 배치 잠수함의 조종성능 추정 (Maneuverability Assessment of a Submarine with X-form Aft Configuration using Virtual Captive Model tests)
* Year Degree Conferred: 2019
* Current Affiliation: Defense Agency for Technology and Quality

###### Jeong-Soo Ha

* Thesis Title: 손상 수상함의 조종 성능 추정을 위한 비대칭성이 고려된 3자유도 운동모델 개발 (Development of 3DOF Dynamic Model for Maneuverability Assessment of a Damaged Surface Combatant)
* Year Degree Conferred: 2018
* Current Affiliation: Republic of Korea Naval Academy

###### Sae-Yong Park

* Thesis Title: 고속 활주선 선미 인터셉터 선저 압력 계측 모형실험 (Pressure Measurements on High Speed Planing Hull with Interceptors)
* Year Degree Conferred: 2018
* Current Affiliation: Avikus Co., Ltd.

###### Hak-Kyu Choi

* Thesis Title: 전산유체역학 해석을 통한 수면관통물체 주위 유동의 LES/RANS 해석 (LES/RANS Analysis around a Surface-Piercing Body Using Computational Fluid Dynamics)
* Year Degree Conferred: 2017
* Current Affiliation: LG electronics

###### Gwanhoon Kim

* Thesis Title: 실험계획법을 CFD에 적용한 부가저항 감소 목적의 선수형상 최적화 연구 (Bow Design Parameter Optimization for Added Resistance Reduction by Applying the Design of Experiments to CFD)
* Year Degree Conferred: 2017
* Current Affiliation: Hyundai Heavy Industries Co., Ltd.

###### Marco Polo Espinoza Haro

* Thesis Title: Numerical Simulation of Self-Propelling Damaged Cruise Ship in Head/Following Seas Using Computational Fluid Dynamics
* Year Degree Conferred: 2016
* Current Affiliation: INGINE

###### Sung Taek Park

* Thesis Title: SPIV를 이용한 조류발전터빈의 후류유동 계측 및 상호상관면 중첩법을 이용한 SPIV 해석 알고리즘 개발 (The SPIV Measurement of Wake Flow in Current Turbine and Development of PIV Algorithm Using Reiterated Method of Cross-Correlation Plane)
* Year Degree Conferred: 2014
* Current Affiliation: Univ. of Iowa (Assistant Research Scientist)

###### Mi Yeon Park

* Thesis Title: 풍상 범주 중인 세일링 요트의 세일 변형 해석 및 자세를 고려한 속도 추정 방법 개발 (Sail Deformation Analysis and Velocity Prediction Considering Sailing Attitudes of an Upwind Sailing Yacht)
* Year Degree Conferred: 2014
* Current Affiliation:

###### Taegu Lim

* Thesis Title: 손상 선박의 선수파 중 SRTP 실험을 위한 6자유도 운동 계측 시스템 구축 (Development of 6DOF Motion Measurement System for SRTP Test of a Damaged Ship in Head Seas)
* Year Degree Conferred: 2014
* Current Affiliation: Hyundai Heavy Industries Co., Ltd.

###### Dong Hwan Kim

* Thesis Title: 전산유체역학을 이용한 손상상태 크루즈선의 침수현상, 자유 횡동요 감쇠 그리고 규칙 파랑 중 운동 시뮬레이션 (Simulation of Flooding Procedure, Free Roll Decay and Motion in Regular Wave for Damaged Cruise Ship using Computational Fluid Dynamics)
* Year Degree Conferred: 2013
* Current Affiliation: Chungnam National University

###### Sewan Park

* Thesis Title: 수평축 조류발전 터빈의 비설계 조건을 고려한 성능해석 (Performance analysis of a horizontal axis tidal stream turbine considering off-design conditions)
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###### Ji Myoung You

* Thesis Title: CFD 검증을 위한 손상 선박의 횡동요 감쇠 운동에 대한 실험적 연구 (Experimental study on the roll decay of a damaged ship for CFD validation)
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###### Ju Hyun Lee

* Thesis Title: Computational methods for open water performance prediction of tidal stream turbines
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###### Heebum Lee

* Thesis Title: Fluid-structure interaction analysis of two-dimensional cross section of yacht sails
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###### Ho-Jeong Lim

* Thesis Title: CFD 검증을 위한FPSO 선수부 갑판 침수 실험 (Experimental study of the FPSO bow water shipping for CFD validation)
* Year Degree Conferred: 2011
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###### Chang Min Lee

* Thesis Title: 2차원 타 단면에서 일어나는 캐비테이션 특성의 실험적 연구 (Experiment Study on Cavitation Characteristics on a Two-Dimensional Rudder Section)
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##### J.Ha, and **S.H.Rhee**, “Experimental Investigation of Propulsion Performance of a Partially Submerged Propeller”, 12th Cavitation Symposium, Chania, Greece, June 2-5, 2024.

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##### W.Seok, J.Ahn, J.Oum, H.Eom, J.Park, and **S.H.Rhee**, “부유 쓰레기 수거 로봇과 스테이션의 개발을 위한 기초연구 (A preliminary study on the development of robots and stations for collecting floating waste)”, Annual Spring Meeting of the Society of Naval Architects of Korea, Online, May 2021 (In Korean).

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##### H.B.Lee, B.J.Park, S.H.Rhee, J.H.Bae, K.W.Lee, W.J.Jeong, and S.J.An, “극저온 유체 화물창 방벽 내의 액체유동 및 기화 시뮬레이션 (Liquid Flow and Evaporation Simulation of Cryogenic Fluid in the Wall of Cryogenic Fluid Cargo Containment System)”, Annual Autumn Meeting of the Korea Society of Computational Fluids Engineering, Seoul, Korea, October 2008.

##### H.B.Lee, S.H.Rhee, and J.K.Oh, “수치 계산을 이용한 타의 틈새 유동해석 및 캐비테이션 초생조건 추정 (Rudder Gap Flow Analysis and Cavitation Inception Prediction using Computational Method)”, Annual Spring Meeting of the Society of Naval Architects of Korea, Jeju, Korea, May 2008 (In Korean).

##### J.K.Oh, D.Seo, C.Lee, D.Koh, S.H.Lee, S.H.Rhee, J.C.Suh, and H.Kim, “타의 틈새유동 차단에 의한 캐비테이션 감소 및 압력 변화에 관한 실험적 연구 (Experimental Study on the Cavitation Suppression and Pressure Variation due to the Rudder Gap Flow Blocking Devices)”, Annual Spring Meeting of the Society of Naval Architects of Korea, Jeju, Korea, May 2008 (In Korean).

##### J.K.Oh, D.Seo, S.H.Rhee, S.H.Lee, and H.Kim, “타의 틈새유동 차단장치 개발 및 실험적 검증 (Development of Rudder Gap Flow Blocking Devices and its Concept Verification through Experimental Studies)”, Annual Autumn Meeting of the Society of Naval Architects of Korea, Jeju, Korea, November 2007 (In Korean).

##### S.H.Rhee, J.K.Oh, J.C.Suh, J.M.Lew, and H.Kim, “틈새유동차단장치를 이용한 타 캐비테이션의 회피방안 (Application of Gap Flow Control Devices to Avoid the Rudder Cavitation)”, Annual Spring Meeting of the Society of Naval Architects of Korea, Busan, Korea, May 2006 (In Korean).

##### J.Yang, H.Kim, and S.H.Rhee, “Evaluation of the Propulsive Performances and Ship Flow of a Heeled and Trimmed VLCC”, Annual Autumn Meeting of the Society of Naval Architects of Korea, Sancheong, Korea, October 2004 (In Korean).

## Invited Lectures

##### “수면 근처에서 작동하는 프로펠러와 일정한 속도로 원호를 따라 입수하는 구 주위의 유동(Flow Around a Sphere Submerging Along a Circular Path at Constant Velocity and a Propeller Operating Near the Free Surface)”, 13th National Congress on Fluids Engineering, Korea, July, 2024

##### “함정 설계/건조 기술 관련 전문가 강연(Expert Lecture on Naval Ship Design and Construction Technology)”, Invited Seminar by the Naval Ship Design Technology Department, Korea, June 2024

##### “Semi-submerged Propellers & Surface-piercing Propellers”, Invited Seminar by the Department of Mechanical Systems Engineering, Korea Maritime and Ocean University, Korea, December 2023.

##### “대한조선학회와 조선산업의 상생 발전(Co-prosperous Development of the Society of Naval Architects of Korea and the Shipbuilding Industry)”, Invited Seminar by the Future Technology Research Institute of HD Korea Shipbuilding & Offshore Engineering, Korea, October 2022.

##### “Multi-phase Flow of a Sphere Moving along a Circular Arc through an Interface,” 13th Asian Computational Fluid Dynamics Conference (ACFD2022), Jeju, Korea, October 2022.

##### “Modified Partially-Averaged Navier-Stokes Models for Secondary Flows around a Ship Hull”, 8th Asian Symposium on Computational Heat Transfer and Fluid Flow (ASCHT2021), China University of Petroleum (East China), Qingdao, China, September 2021.

##### “Research on Tidal Stream Turbine at Seoul National University Towing Tank”, 4th International Conference in Ocean Engineering (ICOE2018), Indian Institute of Technology Madras, India, February 2018.

##### “Open Source for Open Innovation”, Semes, Korea, May 2016.

##### “CFD SW 활용의 새로운 파라다임(A New Paradigm in the Utilization of CFD Software)”, Central Technology Institute, Fundamental Technology Research Center, HD Hyundai Heavy Industries, Korea, July 2015.

##### “고효율 축변환 조류발전 터빈 개발 기술(Technologies for Development of High-Efficiency Tidal Stream Turbines)”, Hyundai Engineering and Construction, Seoul, Korea, June 2015.

##### “건물 외부 기류 시뮬레이션”, Seokyoung Systems, Seoul, Korea, March 2015.

##### “조류발전 터빈 성능해석방법 연구(Tidal Stream Turbine Performance Analysis Methods)”, Korea Hydro and Nuclear Power, Daejeon, Korea, March 2015.

##### “Open Innovation in CFD for Naval Architecture”, Seokyoung Systems, Seoul, Korea, January 2015.

##### “New Paradigm in CFD - An Open-Source Approach”, 13th National Annual Conference of Mechanical Engineering, University of Indonesia, Jakarta, Indonesia, October 2014.

##### “Paradigm Change in CFD Led by Open-Source Codes”, CAE Conference 2013, November 2013.

##### “함형설계를 위한 실험 및 전산유체역학(Experimental and Computational Fluid Dynamics for Hull Form Design of Military Vessels)”, 제38회 해양학술세미나(38th Maritime Academic Seminar), Korea Naval Academy, November 2013.

##### “해양레저산업의 6하원칙 - 현황과 발전방향 (Five W’s and One H for Marine Leisure Industry - Current Status and Development Direction)”, 공학한림원 해양산업위원회 3차 워크샵 (3rd Workshop, Ocean Industry Committee, The National Academy of Engineering of Korea), August 2013.

##### “CFD SW의 새로운 패러다임 (New Paradigm of CFD SW)”, Mokpo National University, Mokpo, Korea, December 2012.

##### “CFD 패러다임의 변화 : 소스공개 라이브러리를 이용한 맞춤형 코드 개발 (Paradigm Change in CFD: Customized Code Development Using Open Source Libraries)”, Korean Register of Shipping, Daejeon, Korea, December 2012.

##### “CFD 패러다임의 변화 : 소스공개 라이브러리를 이용한 맞춤형 코드 개발 (Paradigm Change in CFD: Customized Code Development Using Open Source Libraries)”, LG Electronics, Seoul, Korea, September 2012.

##### “Experimental and Computational Research at SNU Towing Tank Lab”, Korea Advanced Institute of Science and Technology, Daejeon, Korea, October 2010.

##### “서울대학교 저항성능실험실 연구 소개 (Research Activities at SNU Towing Tank Lab)”, Pusan National University, Busan, Korea, May 2010.

##### “CFD for Turbulence Modification at the Air-Water Interface”, Oceanographic Center, Nova Southeastern University, Dania Beach, FL, February 2010.

##### “CFD Methods for Ship Hull Wake Simulation Including the Rotating Propeller Effect”, Oceanographic Center, Nova Southeastern University, Dania Beach, FL, February 2009.

##### “Numerical Simulation of Free-Surface Flow for Applications in Naval Architecture and Ocean Engineering”, School of Computational Science, Florida State University, Tallahassee, FL, February 2008.

##### “Interaction between Non-Linear Free-Surface Flow and Body Motion”, ANSYS CFD Conference, Busan, Korea, November 2007.

##### “CFD Application to Naval Architecture”, Korea Maritime University, Busan, Korea, October 2007.

##### “A Few Examples of CFD Application to the Non-Linear Free-Surface Flow and Its Interaction with Body Motion”, Technip USA, Houston, TX, October 2007.

##### “How to Design a Boat”, 2007 Science & Technology Mania Competition, Hanyang Univ., Seoul, Korea, May 2007.

##### “Cavtation Modeling in CFD”, Shipbuilding Industry Users Group Meeting of FLUENT, STX Shipbuilding, Jinahe, Korea, March 2007.

##### “Navier-Stokes Equations-Based Computational Fluid Dynamics for Naval Applications”, SNAME New England Section Meeting, Nashua, NH, December 2006.

##### “FLUENT Applications for Naval Hydrodynamics”, Dept. of Naval Architecture and Ocean Engineering, Mokpo National University, Mokpo, Korea, February 2006.

##### “CFD for Marine Applications”, Dept. of Naval Architecture and Ocean Engineering, Seoul National University, Seoul, Korea, June 2005.

##### “Tank Sloshing Simulation Using a Navier-Stokes Solver”, SNAME Panel H-7 Committee Meeting, Houston, TX, September 2004.

##### “Computational Fluid Dynamics and Its Applications at National Maritime Research Institute of Japan”, Ship Controllability Laboratory, Dept. of Naval Architecture and Ocean Engineering, Seoul National University, Seoul, Korea, June 2001.

##### “Unsteady RANS Method for Surface Ship Boundary Layer, Wake, and Wave Fields”, Research Institute of Marine Systems Engineering, Seoul National University, Seoul, Korea, May 2000.

##### “Unsteady Flow around a Wigley Hull Advancing in Regular Head Waves”, Korea Research Institute of Ship and Ocean Engineering, Daejeon, Korea, May 2000.