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Computational Mechanics and Structural Systems Lab.  
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**RESEARCH INTERESTS**

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Computational Mechanics, Ocean Structural Systems, Hydrodynamics, Experimental Biology

**TEACHING INTERESTS**

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Finite Element Method, Solid and Structural Mechanics, Fluid-Structure Interaction

**EDUCATION**

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Massachusetts Institute of Technology (MIT), Cambridge, MA, USA

Ph.D. Department of Civil and Environmental Engineering. (Sep 2000 - Sep 2003, Degree awarded in Feb 2004)

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

M.S. Department of Civil and Environmental Engineering. (Mar 1997 - Feb 1999)

Hanyang University, Seoul, Korea

B.S. Department of Civil Engineering. (Mar 1990 - Feb 1997, Military service: Dec 1991 - Mar 1994)

**EXPERIENCE**

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Korea Advanced Institute of Science and Technology, Daejeon, Korea

Associate Professor. Department of Mechanical Engineering. (Mar 2015 - )

Associate Professor. Division of Ocean Systems Engineering. (Feb 2009 - Feb 2015)

Samsung Heavy Industries, Seoul, Korea

Manager. Marine Concrete Structure Team. (Oct 2005 - Jan 2009)

McGill University, Montreal, QC, Canada

Postdoctoral Researcher. Department of Civil Engineering and Applied Mechanics. (May 2004 - Aug 2005)

Massachusetts Institute of Technology, Cambridge, MA, USA

Postdoctoral Researcher. Department of Mechanical Engineering. (Nov 2003 - Apr 2004)

Korea Institute of Construction Technology, Kyunggi, Korea

Researcher. Structural System Group. (Aug 1999 - Jun 2000)

**PUBLICATIONS**

Corresponding authors are underlined.

**Articles in International Journals**

1. Seo H, Park HJ, Lee PS. A new density interpolation method for smoothed particle hydrodynamics. *Computer Methods in Applied Mechanics and Engineering*, in preparation.
2. Park HJ, Seo H, Lee PS. A wall boundary treatment method for simulating 2D surface flows in SPH. *Computer Methods in Applied Mechanics and Engineering*, in preparation.
3. Hyun C, Boo SH, Lee PS. Improving the computational efficiency of the enhanced AMLS method. *Computer Methods in Applied Mechanics and Engineering*, under review.
4. Kim HJ, Yoon K, Lee PS. Continuum mechanics based beam elements for linear and nonlinear analyses of multi-layered composite beams with interlayer slips. *Composite Structures*, under review.
5. Cho SR, Muttaqie T, Sohn JM, Park SH, Choi G, Han S, Lee PS, Cho YS. Quasi-static and dynamic implosion tests of thin aluminium-alloy cylindrical tube under external hydrostatic pressure, under review.
6. Yeo S, Yoon K, Lee PS, Hong Y, Cha J, Chung H. Novel accuracy control system for offshore floating docks using ballast planning based on structural analysis. under review.
7. Kim JH, Boo SH, Lee PS. A dynamic condensation method with free interface substructuring. *Mechanical Systems and Signal Processing*, under revision.
8. Lee CM, Lee PS. The strain-smoothed MITC3+ shell element. *Computers and Structures*, under revision.
9. Kim S, Lee PS. New enriched 3D solid finite elements: 8-node hexahedral, 6-node prismatic, and 5-node pyramidal elements. *Computers & Structures*, published online.
10. Zhao Y, Lee PS, Chung H. Effect of pulsing parameters on drop transfer dynamics and heat transfer behavior in pulsed gas metal arc welding. *International Journal of Heat and Mass Transfer*, 129, 1110-1122. Jan 2019.
11. Lee C, Lee PS. A new strain smoothing method for triangular and tetrahedron finite elements. *Computer Methods in Applied Mechanics and Engineering*, 341, 939-955. Nov 2018.
12. Jun H, Yoon K, Lee PS, Bathe KJ. The MITC3+ shell element enriched in membrane displacements by interpolation cover. *Computer Methods in Applied Mechanics and Engineering*, 337, 458-480. Aug 2018.
13. Kim S, Lee PS. A new enriched 4-node 2D solid finite element free from the linear dependence problem. *Computers & Structures*, 202, 25-43. Jun 2018.
14. Park SG, Jeong YC, Kim DG, Lee MH, Shin A, Park G, Ryoo J, Hong J, Bae S, Kim CH, Lee PS, Kim D. Medial preoptic circuit induces hunting-like actions to non-social objects and prey. *Nature Neuroscience*, 21, 364-372. Mar 2018.
15. Boo SH, Kim JH, Lee PS. Towards improving the enhanced Craig-Bampton method. *Computers & Structures*, 196, 63-75. Feb 2018.
16. Kim JM, Boo SH, Lee PS. Considering the higher-order effect of residual modes in the Craig-Bampton method. *AIAA Journal*, 56(1), 403-412. Jan 2018.
17. Ko Y, Lee Y, Lee PS, Bathe KJ. Performance of the MITC3+ and MITC4+ shell elements in widely-used benchmark problems. *Computers & Structures*, 193, 187-206. Dec 2017.

18. Ko Y, Lee PS, Bathe KJ. A new 4-node MITC element for analysis of two-dimensional solids and its formulation in a shell element. *Computers & Structures*, 192, 34-49. Nov 2017.
19. Yoon K, Lee PS, Kim DN. An efficient warping model for elastoplastic torsional analysis of composite beams. *Composite Structures*, 178, 37-49. Oct 2017.
20. Kim SY, Lee PS. Modeling of helically stranded cables using multiple beam elements and its application to torque balance design. *Construction and Building Materials*, 151, 591-606. Oct 2017.
21. Kim JH, Kim JM, Lee PS. Improving the accuracy of the dual Craig-Bampton method. *Computers & Structures*, 191, 22-32. Oct 2017.
22. Ko Y, Lee PS. A 6-node triangular solid-shell element for linear and nonlinear analysis. *International Journal for Numerical Methods in Engineering*, 111(13), 1203-1230. Sep 2017.
23. Ko Y, Lee PS, Bathe KJ. The MITC4+ shell element in geometric nonlinear analysis. *Computers & Structures*, 185, 1-14. Jun 2017.
24. Yoon JS, Lee PS. Towards hydro-elastoplastic analysis of floating plate structures. *Journal of Fluids and Structures*, 71, 164-182. May 2017.
25. Kim DG, Lee S, Kim CH, Jo S, Lee PS. Parasitic robot system for turtle's waypoint navigation. *Journal of Bionic Engineering*, 14(2), 327-335. Apr 2017.
26. Yoon K, Kim DN, Lee PS. Nonlinear torsional analysis of 3D composite beams using the extended St. Venant solutions. *Structural Engineering and Mechanics*, 62(1), 33-42, Apr 2017.
27. Boo SH, Lee PS. An iterative algebraic dynamic condensation method and its performance. *Computers & Structures*, 182, 419-429. Apr 2017.
28. Ko Y, Lee PS, Bathe KJ. A new MITC4+ shell element. *Computers & Structures*, 182, 404-418. Apr 2017.
29. Boo SH, Lee PS. A dynamic condensation method using algebraic substructuring. *International Journal for Numerical Methods in Engineering*, 109(12), 1701-1720. Mar 2017.
30. Kim CH, Kim DG, Kim D, Lee PS. Directing turning behavior of carp using virtual stimulation. *Ocean Systems Engineering*, 7(1), 39-51. Mar 2017.
31. Lee KH, Lee PS. Nonlinear hydrostatic analysis of flexible floating structures. *Applied Ocean Research*, 59, 165-182, Sep 2016.
32. Kim CH, Choi B, Kim DG, Lee S, Jo S, Lee PS. Remote navigation of turtle by controlling instinct behavior via human brain-computer interface. *Journal of Bionic Engineering*, 13, 491-503, Jul 2016.
33. Kim JG, Boo SH, Lee CO, Lee PS. On the computational efficiency of the error estimator for Guyan reduction. *Computer Methods in Applied Mechanics and Engineering*, 305, 759-776, Jun 2016.
34. Ko Y, Lee PS, Bathe KJ. The MITC4+ shell element and its performance. *Computers & Structures*, 169, 57-68, Jun 2016.
35. Boo SH, Kim JG, Lee PS. Error estimation for the automated multi-level substructuring method. *International Journal for Numerical Methods in Engineering*, 106, 927-950, Jun 2016.
36. Boo SH, Kim JG, Lee PS. A simplified error estimator for the CB method and its application to error control. *Computers & Structures*, 164, 53-62, Feb 2016.
37. Yoon K, Lee PS, Kim DN. Geometrical nonlinear finite element analysis of functionally graded 3D beams considering warping effects. *Composite Structures*, 132, 1231-1247, Nov 2015.

38. Lee KH, Kim MG, Lee JI, Lee PS. Recent advances in ocean nuclear power plants. *Energies*, 8(10), 11470-11492, Oct 2015.
39. Kim J, Kim JG, Yun G, Lee PS, Kim DN. Towards modular analysis of supramolecular protein assemblies. *Journal of Chemical Theory and Computation*, 11(9), 4260-4272, Sep 2015.
40. Kim JG, Lee PS. Posteriori error estimation method for flexibility-based component mode synthesis. *AIAA Journal*, 53(10), 2828-2837, Sep 2015.
41. Lee KH, Cho S, Kim KT, Kim JG, Lee PS. Hydroelastic analysis of floating structures with liquid tanks and comparison with experimental tests. *Applied Ocean Research*, 52, 167-187, Aug 2015.
42. Kim JG, Lee PS. An enhanced Craig-Bampton method. *International Journal for Numerical Methods in Engineering*, 103, 79-93, Jul 2015.
43. Lee Y, Jeon HM, Lee PS, Bathe KJ. The modal behavior of the MITC3+ triangular shell element. *Computers & Structures*, 153, 148-164, Jun 2015.
44. Kim JG, Boo SH, Lee PS. An enhanced AMLS method and its performance. *Computer Methods in Applied Mechanics and Engineering*, 287, 90-111, Apr 2015.
45. Jeon HM, Lee Y, Lee PS, Bathe KJ. The MITC3+ shell element in geometric nonlinear analysis. *Computers & Structures*, 146, 91-104, Jan 2015.
46. Kim YY, Choi KJ, Chung H, Han S, Lee PS. A ship-to-ship automatic docking system for ocean cargo transfer. *Journal of Marine Science and Technology*, 19, 360-375, Dec 2014.
47. Yoon K, Lee PS. Nonlinear performance of continuum mechanics based beam elements focusing on large twisting behaviors. *Computer Methods in Applied Mechanics and Engineering*, 281, 106-130, Nov 2014.
48. Kim MG, Lee KH, Lee PS, Kim SG, Woo IG, Han JH, Lee JI. Conceptual studies of construction and safety enhancement of ocean SMART mounted on GBS. *Nuclear Engineering and Design*, 278, 558-572, Oct 2014.
49. Kim JG, Lee PS. An accurate error estimator for Guyan reduction. *Computer Methods in Applied Mechanics and Engineering*, 278, 1-19, Aug 2014.
50. Kim JG, Lee KH, Lee PS. Estimating relative eigenvalue errors in the Craig-Bampton method. *Computers & Structures*, 139, 54-64, Jul 2014.
51. Lee Y, Lee PS, Bathe KJ. The MITC3+ shell finite element and its performance. *Computers & Structures*, 138, 12-23, Jul 2014.
52. Yoon JS, Cho SP, RG Jiwinangun, Lee PS. Hydroelastic analysis of floating plates with multiple hinge connections in regular waves. *Marine Structures*, 36, 65-87, Apr 2014.
53. Jeon HM, Lee PS, Bathe KJ. The MITC3 shell finite element enriched by interpolation covers. *Computers & Structures*, 134, 128-142, Apr 2014.
54. Kim JG, Cho S, Kim KT, Lee PS. Hydroelastic design contour for the preliminary design of very large floating structures. *Ocean Engineering*, 78, 112-123, Mar 2014.
55. Yoon K, Lee PS. Modeling the warping displacement fields for discontinuously varying arbitrary cross-section beams. *Computers & Structures*, 131, 56-69, Jan 2014.
56. Kim KT, Lee PS, Park KC. A direct coupling method for 3D hydroelastic analysis of floating structures. *International Journal for Numerical Methods in Engineering*, 96(13), 842-866, Dec 2013.
57. Hong WT, Lee PS. Coupling flat-top partition of unity method and finite element method. *Finite Elements in Analysis and Design*, 67, 43-55, May 2013.

58. Lee S, Kim CH, Kim DG, Kim HG, Lee PS, Myung H. Remote guidance of untrained turtles by controlling voluntary instinct behavior. PLOS ONE, 8(4), Apr 2013.
59. Hong WT, Lee PS. Mesh based construction of flat-top partition of unity. Applied Mathematics and Computation, 219(16), 8687-8704, Apr 2013.
60. Lee K, Lee KH, Lee JI, Jeong YH, Lee PS. A new design concept for offshore nuclear power plants with enhanced safety features. Nuclear Engineering and Design, 254, 129-141, Jan 2013.
61. Yoon K, Lee Y, Lee PS. A continuum mechanics based 3-D beam finite element with warping displacements and its modeling capabilities. Structural Engineering and Mechanics, 43(4), 411-437, Sep 2012.
62. Lee Y, Yoon K, Lee PS. Improving the MITC3 shell finite element by using the Hellinger-Reissner principle. Computers & Structures, 110-111, 93-106, Sep 2012.
63. Thanh CD, Zi G, Lee PS, Rabczuk T, Song JH. Phantom-node method for shell models with arbitrary cracks. Computers & Structures, 92-93, 242-256, Feb 2012.
64. Kim YY, Choi KJ, Chung H, Lee PS. Axiomatic design study for automatic ship-to-ship mooring system for container operations in open sea. Ocean Systems Engineering, 1(2), 157-169, Jun 2011.
65. Bathe KJ, Lee PS. Measuring the convergence behavior of shell analysis schemes. Computers & Structures, 89(3-4), 285-301, Feb 2011.
66. Lee PS, Noh HC. Inelastic buckling behavior of steel members under reversed cyclic loading. Engineering Structures, 32(9), 2579-2595, Sep 2010.
67. Lee PS, Bathe KJ. The quadratic MITC plate and MITC shell elements in plate bending. Advances in Engineering Software, 41(5), 712-728, May 2010.
68. Noh HC, Lee PS, Choi CK. Variability of displacements and stresses at random variable state. Structural Engineering and Mechanics, 31(6), 751-754, Apr 2009.
69. Lee PS, Noh HC, Choi CK. Geometry-dependent MITC method for a 2-node iso-beam element. Structural Engineering and Mechanics, 29(2), 203-221, May 2008.
70. Noh HC, Lee PS. Higher order weighted integral stochastic finite element method and simplified first-order application. International Journal of Solids and Structures, 44(11-12), 4120-4144, Jun 2007.
71. Lee PS, McClure G. Elastoplastic large deformation analysis of a lattice steel tower structure and comparison with full-scale tests. Journal of Constructional Steel Research, 63(5), 709-717, May 2007.
72. Lee PS, Noh HC, Bathe KJ. Insight into 3-node triangular shell finite elements: the effects of element isotropy and mesh patterns. Computers & Structures, 85(7-8), 404-418, Apr 2007.
73. Lee PS, McClure G. A general 3D L-section beam finite element for elastoplastic large deformation analysis. Computers & Structures, 84(3-4), 215-229, Jan 2006.
74. Lee PS, Bathe KJ. Insight into finite element shell discretizations by use of the “basic shell mathematical model.” Computers & Structures, 83(1), 69-90, Jan 2005.
75. Lee PS, Bathe KJ. Development of MITC isotropic triangular shell finite elements. Computers & Structures, 82(11-12), 945-962, May 2004.
76. Bathe KJ, Chapelle D, Lee PS. A shell problem ‘highly-sensitive’ to thickness changes. International Journal for Numerical Methods in Engineering, 57(8), 1039-1052, Jun 2003.
77. Bathe KJ, Lee PS, Hiller JF. Towards improving the MITC9 shell element. Computers & Structures, 81(8-11), 477-489, May 2003.

78. Lee PS, Bathe KJ. On the asymptotic behavior of shell structures and the evaluation in finite element solutions. Computers & Structures, 80(3-4), 235-255, Feb 2002.
79. Choi CK, Lee PS, Park YM. Defect-free 4-node flat shell element: NMS-4F element. Structural Engineering and Mechanics, 8(2), 207-231, Aug 1999.

#### Articles in Domestic Journals

1. Choi G, Jung K, Son SJ, Kim JC, Lee PS. Underwater explosion experiments using pentolite (펜톨라이트를 이용한 수중폭발 실험). Journal of KSEBE (대한화약발파공학회), 35(3), 21-30, Sep 2017.
2. Kim JY, Yoon JS, Lee PS, Kim YS. Damage assessment of bridges caused by Tsunami (지진해일에 의한 교량의 피해유형 분석). Journal of KOSHAM, 15(3), 1-8, Jun 2015.
3. Lee JH, Yoon SJ, Chung H, Lee PS. The conceptual design of semi-submersible type mobile harbor using axiomatic design principles (공리설계를 이용한 반잠수식 모바일하버의 개념설계). Journal of Korea Society of CAD/CAM Engineers, 15(3), 189-203, Jun 2010.
4. Zi G, Kim JG, Lee SO, Lee PS. Development of a design chart for the initial design stage of very large floating structures (초대형 부유식 해상구조물의 초기 설계를 위한 설계차트 개발). Journal of KSCE, 30(2B), 315-324, May 2010.
5. Lee PS, Noh HC. On the finite element analysis of shell structures (셸 구조물의 유한요소해석에 대하여). Journal of KSCE, 27(3A), 277-289, May 2007.
6. Noh HC, Lee PS. Random variable state and response variability (확률변수상태와 응답변화도). Journal of KSCE, 26(6A), 1001-1011, Nov 2006.
7. Choi CK, Lee PS, Park YM. A 4-node non-conforming flat shell element with drilling degree of freedom (면내회전자유도를 가지는 4절점 비적합 평면 셸요소의 개발). Journal of KSCE, 19(I-5), 663-673, Sep 1999.

#### Books

1. Lee PS. Advanced Analysis of Solids and Structures (고등구조해석), 2012.
2. Lee PS, Park YH, Kim SS, Kim DG. 신재생 해양에너지 시스템, 2018.

#### PRESENTATIONS

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Corresponding authors are underlined.

#### Conference Proceedings & Presentations

1. Lee C, Lee DH, Lee PS. Strain-smoothed element method (변형을 평활화 요소법). COSEIK 2019 춘계학술대회, Apr 2019.
2. Lee PS. Past, present and future of the finite element method (유한요소법의 과거, 현재와 미래). KSME 2017 겨울학술대회 초청강연, Dec 2018.
3. Na Y, Lee PS, Lee S. Future development of unmanned maritime system (미래 해양 무인체계의 효과적 개발 방향). Naval ship technology & weapon systems seminar (함정기술세미나), Oct 2018.

4. Kim KJ, Kim HS, Kim S, Jung HT, Kim DW, Park TI, Lee PS, Kim D. A self-inflatable composite oil fence: concept and development. The 8th PAAMES Forum and AMEC 2018 Conference, Oct 2018.
5. Park H, Choi H, Shin S, Lee PS. Numerical simulation of explosive gas bubbles using BEM. The fifth KAIST-SJTU- U.Tokyo symposium. Sep 2018.
6. Seo H, Kim Y, Kim G, Kwon OJ, Lee PS. Multi-physics numerical simulation for offshore floating wind turbines. The fifth KAIST-SJTU- U.Tokyo symposium. Sep 2018.
7. Lee PS, Hyun C, Oh MH. Model reduction methods and their applications to marine structures. The fifth KAIST-SJTU- U.Tokyo symposium. Sep 2018.
8. Kim S, Lee PS. Performance of the enriched 8-node 3D solid finite element free from the linear dependence problem. 35<sup>th</sup> International Conference on Computational Structures Technology (CSTX2018), Sep 2018.
9. Jung H, Lee PS. Modeling of contact between beams with arbitrary cross-sections. World Congress on Advances in Civil, Environmental, and Material Research (ACEM18), Aug 2018.
10. Lee PS, Lee C, Lee KH, Kim JM, Lee K. New concepts for ocean nuclear power plants. Plenary lecture in World Congress on Advances in Civil, Environmental, and Material Research (ACEM18), Aug 2018.
11. Seo HD, Kim Y, Lee PS, Kwon OJ. Aero-elastic-hydro coupled dynamic analysis for offshore floating wind turbines. DTU-KAIST workshop, Aug 2018.
12. Hyun C, Boo SH, Lee PS. Improving the computational efficiency of the AMLS method for structural dynamic analysis (구조 동역학 해석을 위한 EAMLS 기법의 전산 효율성 개선). KSME conference, Apr 2018.
13. Kim G, Lee PS. Two dimensional fracture analysis using the extended finite element method with polynomial enrichment technique. 2018 KOSEIK annual Conference, Mar 2018.
14. Lee PS, Kim S, Kim HJ, Lee DH, Lee C. Introduction to recent finite element technologies for analysis of solids, shells and beams. Invited lecture in the fourth International Conference on Computational Design in Engineering (CODE2018), Mar 2018.
15. Kim YY, Choi GG, Lee PS, Han SH, Cho SR, Cho YS. Research on Near Field Underwater Impact Treats. NSSW Korea (한국 충격파 심포지움), Feb 2018.
16. Park HJ, Seo HD, An CW, Lee PS. Simulation of explosive gas bubbles under zero gravity using boundary element method (경계요소법을 이용한 무중력 하에서의 폭발 가스버블의 거동모사). Naval ship technology & weapon systems seminar (함정기술세미나), Oct 2017.
17. Kim H, Choi G, Na Y, Lee PS, Park KH, Chung H. A study on underwater shock generation for non-explosive ship shock test (무폭약 수중충격 시험을 위한 수중 충격파 발생 기술 연구). Naval ship technology & weapon systems seminar (함정기술세미나), Oct 2017.
18. Cho SR, Teguh M, Park SH, Han SH, Lee PS, Cho YS. Implosion test of aluminum pipe (알루미늄 파이프의 내파실험). Naval ship technology & weapon systems seminar (함정기술세미나), Oct 2017.
19. Lee PS, Boo SH, Kim JH. High performance reduction methods for dynamics FE models. 2017 KAIST-ITB Workshop, Oct 2017.
20. Lee C, Lee PS. Concept design of TLP-type ocean nuclear power plant. The fourth KAIST-SJTU- U.Tokyo symposium. Sep 2017.

21. Kim S, Lee PS. Performance of a new enriched 2D solid finite element. 2017 ASEM conference, Aug 2017.
22. Boo SH, Kim JH, Oh MH, Lee PS. On the reduction methods of structural finite element models. Keynote lecture in 2017 International Conference on Innovative Structural Engineering and Mechanics (ISEM17), Aug 2017.
23. Oh MH, Boo SH, Lee PS, Kim JM, Moon JS, Sim SW. Applications of the static condensation technique to nonlinear structural analysis of floating offshore structures. The 36th International Conference on Ocean, Offshore & Arctic Engineering (OMAE2017), Jun 2017.
24. Lee KH, Park JS, Kim JW, Lee PS. Hydrodynamic analysis of floating structures with baffled sloshing tanks. ISOPE, 2017.
25. Boo SH, Lee PS. Recent developments in model reduction methods. Semi-plenary lecture in the 6<sup>th</sup> International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering (COMPDYN 2017), Jun 2017.
26. Kim JH, Kim S, Lee PS. 부구조의 독립된 병렬처리가 가능한 자유도 기반 축소시스템 구축 (A degrees of freedom based model reduction method capable of substructural parallel processing). KSME 2017 춘계 학술대회, May 2017.
27. Kim S, Kim JH, Lee PS. PU 기반 유한요소법을 이용한 평면응력 문제의 고유치 해석 (Eigenvalue analysis of the plane stress problem using the PU-based finite element method). KSME 2017 춘계 학술대회, May 2017.
28. Seo HD, Park HJ, Lee PS. SPH 기법을 이용한 2 차원 댐 붕괴 문제의 압력 추정에 관한 연구. 한국시뮬레이션학회 2017 춘계 학술대회, Apr 2017.
29. Park HJ, Seo HD, Lee PS. 2 차원 기포상승 시뮬레이션을 위한 이동최소자승법 기반 SPH 모델의 개발. 한국시뮬레이션학회 2017 춘계 학술대회, Apr 2017.
30. Kim DG, Lee PS. Turtle's waypoint navigation system using robot-animal interaction (로봇-동물 상호작용을 통한 거북의 운동경로 제어 시스템). 대한기계학회 바이오공학 2017 춘계 학술대회, Apr 2017.
31. Yoon JS, Kim JH, Seo HD, Park HJ, Lee KH, Cho SP, Lee PS. Hydrodynamic analysis in ocean engineering problems. 2016 KAIST-ITB Workshop, Dec 2016.
32. Lee DH, Lee PS. New design concept of floating wind turbine platform (부유식 해상 풍력발전기의 신개념 하부 플랫폼 설계). KSNRE (Korean Society for New and Renewable Energy) conference, Nov 2016.
33. Seo HD, Kim YJ, Kwon OJ, Lee PS. Aero-hydro coupled dynamic analysis of offshore floating wind turbines (부유식 풍력발전기에 대한 공력-수력 연동해석). KSNRE (Korean Society for New and Renewable Energy) conference, Nov 2016.
34. Park HJ, Kim HJ, Lee PS, Chung H. 수중폭발로 인한 유체응답의 수치적·실험적 거동 비교. Naval ship technology & weapon systems seminar (함정기술세미나), Oct 2016.
35. Lee PS, Yoon JS, Lee KH, Kim JH, Kim G, Hyun C. Fluid-Structure Interaction in Ocean Engineering. Keynote lecture in The 2016 Structures Congress (Structures 16), Aug 2016.
36. Seo HD, Kim YJ, Jeong HT, Kwon OJ, Lee PS. Code development for coupled dynamic analysis of offshore floating wind turbines. The third U.Tokyo- SJTU-KAIST symposium, Aug 2016 (Best poster award).



37. Jung K, Chung H, Kim YY, Lee PS. Development of rapid response equipments for ocean HNS spill accident (HNS 유출방지 및 차단기술 개발). KIHM (Korean Institute of Hazardous Materials) conference, Aug. 2016.
38. Lee DH, Lee PS. Preliminary design of a wheel-type tension leg platform for floating wind turbines. DTU-KAIST symposium, Aug 2016.
39. Boo SH, Oh MH, Lee PS. A multi-level static condensation method for local analysis. The 12<sup>th</sup> World Congress on Computational Mechanics (WCCM 2016), Jul 2016.
40. Yoon K, Lee PS, Kim DN. On elastoplastic torsional analysis of composite beam. The 12<sup>th</sup> World Congress on Computational Mechanics (WCCM 2016), Jul 2016.
41. Kim S, Kim JH, Lee PS. Simple solution to the linear dependence problems of partition of unity-based FEM (PU 기반 유한요소법의 선형종속 문제 해결 방법). KSME conference, Apr 2016.
42. Kim JH, Yoon JS, Lee PS. Improving the dual Craig-Bampton method using higher-order residual flexibilities. KSME conference (고차 잔류 유연도를 이용한 향상된 Dual Craig-Bampton 기법의 개발). Apr 2016.
43. Yoon JS, Kim S, Lee PS. Impact response analysis of a floating plate considering hydro-elastoplasticity (유탄소성을 고려한 부유식 평판의 충격 응답 해석). KSME conference, Apr 2016.
44. Yoon K, Lee PS, Kim DN. Finite element formulation for functionally graded beam structures. The 3rd International Conference on Computational Design in Engineering, Dec 2015.
45. Lee PS, Y Lee, K Yoon. Recent developments on shell and beam finite elements. KAIST-Tsinghua Joint Workshop, Dec 2015.
46. Kim J, Kim JG, Yun G, Lee PS, Kim DN. Modular analysis of supramolecular protein using finite element method (고분자량 단백질의 모듈기반 유한요소해석). KSME (Korean Society of Mechanical Engineers) conference, Nov 2015.
47. Lee PS, Park HJ, Lee CM. Our recent studies on hydro-static and -dynamic analyses. The second SJTU- U. Tokyo-KAIST symposium. Oct 2015.
48. Boo SH, Lee PS. Our contribution to model reduction technology, SNU-KAIST Computational Mechanics Workshop, Oct 2015.
49. Lee KH, Lee PS. Fluid-Structure Interaction in ocean engineering, SNU-KAIST Computational Mechanics Workshop, Oct 2015.
50. Lee KH, Lee PS. Nonlinear hydrostatic analysis of deformable floating structures. The 7<sup>th</sup> International Conference on Hydroelasticity in Marine Technology (HYEL2015), Sep 2015.
51. Kim SH, Choi GG, Lee PS. A new concept of blast hardened bulkheads: feasibility study of aluminum, foam attached BHBs. 2015 International Conference on International Conference on Ocean Systems Engineering (ICOSE2015), Aug 2015.
52. Kim HJ, Yoon K, Kim DN, Lee PS. Modeling capability of continuum mechanics based beam elements. 2015 International Conference on Innovative Structural Engineering & Mechanics (ISEM2015), Aug 2015.
53. Ko Y, Lee PS. Reducing the membrane locking in the MITC4 shell element. 2015 International Conference on Innovative Structural Engineering & Mechanics (ISEM2015), Aug 2015.
54. Kim JG, Boo SH, Lee PS. Performance of the enhanced Craig-Bampton method. 2015 International Conference on Innovative Structural Engineering & Mechanics (ISEM2015), Aug 2015.

55. Lee Y, Lee PS. Convergence behavior of the MITC3+ triangular shell element. 2015 International Conference on Innovative Structural Engineering & Mechanics (ISEM2015), Aug 2015.
56. Lee PS, Lee Y, Yoon K. Towards improving shell and beam finite elements. Keynote lecture in 2015 International Conference on Innovative Structural Engineering & Mechanics (ISEM2015), Aug 2015.
57. Seo HD, Kim Y, Kwon OJ, PS Lee. Coupled dynamic analysis for floating wind turbines. DTU-KAIST symposium, Aug 2015.
58. Cho S, Lee KH, Lee PS. Hydroelastic experiment of a floating structure with liquid tanks. The 8th Euro-Korean Conference on Science and Technology (EKC 2015), Strasbourg, France, Jul. 2015
59. Lee DH, Seo HD, Boo SH, Lee PS. New design concept of floating wind turbine platform (부유식 해상 풍력발전기의 신개념 하부 플랫폼 설계), KAEA (Korea Wind Energy Association) conference, Jun 2015.
60. Kim JH, Yoon K, Lee PS. Hydroelastic analysis of long span submerged floating tunnels under seismic loads, ECCOMAS MSF 2015: The 2nd International Conference on Multi-scale Computational Methods for Solids and Fluids, Jun 2015.
61. Kim JG, Boo SH, Lee PS. Improving dynamic substructuring methods (향상된 동적 부구조법의 소개). KSNVE (Korean Society for Noise and Vibration Engineering) conference, Apr 2015.
62. Yoon JS, Lee PS. Hydro-elastoplastic analysis of floating plates in waves. The 30th International Workshop on Water Waves and Floating Bodies (IWWF2015), Apr 2015.
63. Lee KH, Boo SH, Kim JG, Lee PS. Nonlinear hydrostatic analysis of elastic floating bodies (탄성 부유체의 비선형 유체 정역학 해석). COSEIK conference, Apr 2015.
64. Boo SH, Lee KH, Kim JG, Lee PS. Error estimation technique for the AMLS method (AMLS 기법으로 계산된 고유치의 오차추정). COSEIK conference, Apr 2015.
65. Kim H, Yoon K, Lee PS. A new method for modeling interlayer slips in 3D beam analysis (새로운 빔의 내부슬립 모델링 방법). COSEIK conference, Apr 2015.
66. Kim J, Kim JG, Yun G, Lee PS, Kim DN. Application of component mode synthesis in protein dynamics (단백질 동역학에서의 부분구조합성법 적용). COSEIK conference, Apr 2015.
67. Yoon K, Kim H, Kim DN, Lee PS. Improving the nonlinear performance of Timoshenko beam elements by using the eigen-recomposition method (고유재조합법을 이용한 티모센코 빔 요소의 비선형 해석 성능 향상). COSEIK conference, Apr 2015.
68. Kim JY, Kim YS, Yoon JS, Lee PS. 3D numerical analysis of Imwon port for estimating Tsunami wave forces (지진해일 파력 추정을 위한 임원항 3 차원 수치해석). KOSHAM (Korean Society of Hazard Mitigation) conference, Feb 2015 (awarded).
69. Lee KH, Lee PS, Kim MG, Lee JI. Concept design and safety features of nuclear power plants mounted on gravity based structures. Invited in the 10th International Topical Meeting on Nuclear Thermal-Hydraulics, Operation and Safety (NUTHOS-10), Dec 2014.
70. Kim JG, Boo SH, Lee PS. Enhanced automated multi-level substructuring method. 2014 Symposium on Multiscale & Multiphysics Mechanics (MMM'14), Dec 2014.
71. Kim SH, Choi GG, Lee PS. Analysis of aluminum foam attached blast hardened bulkheads and comparison with chamber model blast tests (발포알루미늄 부착 폭발강화격벽의

- 챔버모형실험 폭발응답 해석). Naval ship technology & weapon systems seminar (함정기술세미나), Oct 2014.
72. Kim JH, Lee PS. Hydroelastic analysis of submerged floating tunnel. The First SJTU-U. Tokyo-KAIST symposium. Sep 2014.
  73. Lee KH, Son YJ, Lee PS. Preliminary design procedure of baffled anti-roll tanks. The First SJTU-U. Tokyo-KAIST symposium. Sep 2014.
  74. Yoon K, Lee PS. A continuum mechanics based beam finite element for geometric and material nonlinear analysis. International Conference on Computational Structures Technology (CST2014), Sep 2014.
  75. Lee KH, Kim S, Lee PS. Extreme roll motion assessment of ART equipped floating structures by spectral analysis. 2014 International Conference on Advances in Coupled Systems Mechanics (ACSM14), Aug 2014.
  76. Yoon JS, Lee PS. Assessment of damages to civil engineering structures caused by Tsunami. International seminar on Tsunami (토목구조물에 미치는 지진해일 피해분석 기술개발), COSEIK conference, Aug 2014.
  77. Cho SP, Boo SH, Lee KH, Lee PS. New floating body concepts for floating wind turbines. DTU-KAIST symposium, Jun 2014.
  78. Kim SH, Ko Y, Lee PS. Shock response analysis of aluminum form attached blast hardened bulkheads (발포알루미늄 부착 폭발강화격벽의 함정 내부폭발 응답해석). KAOSTS conference, May 2014.
  79. Han SH, Shin YS, Lee PS, Chung H, Na YS, Choi GG. Design and technology development of blast bulkhead structures (폭발강화격벽 설계 및 기술 개발). KAOSTS conference, May 2014.
  80. Lee PS. Development state and future prospect of ocean nuclear systems (국내외 해양원자력 시스템 개발현황 및 전망). KAOSTS conference, May 2014.
  81. Jeon HM, Yoon K, Lee PS. Development of the enriched MITC3 shell finite element (Enriched MITC3 셸 요소 개발). KSME conference, Apr 2014.
  82. Yoon K, Jeon HM, Lee PS. Introduction to continuum mechanics based beam elements (연속체 역학 기반 빔 유한요소). KSME conference, Apr 2014.
  83. Kim JH, Seo SI, Sagong M, Lee PS. Hydroelastic analysis of submerged floating tunnels under seismic loads (지진하중을 받는 해중터널의 유탄성 거동에 관한 수치해석적 연구). Korean Society for Noise and Vibration Engineering (KSNVE) conference, Apr 2014.
  84. Kim JG, Lee PS. Reliability estimation of reduced-order models (차수감소모델의 신뢰성 예측). Korean Society for Noise and Vibration Engineering (KSNVE) conference, Apr 2014.
  85. Lee PS, Lee KH, Kim KT. A direct coupling method for hydroelastic analysis. Ship hydrodynamics research association conference, Feb 2014.
  86. Zhang B, Kim S, Boo SH, Cho SP, Lee PS. A new construction method for ships and its feasibility. SNAK Conference, Nov 2013.
  87. Yeo S, Yoon K, Lee PS, Hong Y, Cha JH, Chung H. Ballasting plan optimization for accuracy control on offshore floating dock. The 12<sup>th</sup> International Symposium on Practical Design of Ships and Other Floating Structures (PRADS), Oct 2013.
  88. Park HW, Markovic D, Kim JG, Lee PS, Park KC. Flexibility-based structural component mode synthesis: Its history, promise and future potential. The 26<sup>th</sup> Nordic Seminar on Computational Mechanics, Oct 2013.

89. Choi SP, Kim JG, Lee PS. Hydroelastic design contour for the preliminary design of pontoon-type rectangular VLFS. UT-KAIST Symposium, Aug 2013.
90. Lee KH, Kim S, Kim HJ, Lee PS. A 3D hydroelastic analysis of floating barge with sloshing in water waves. UT-KAIST Symposium, Aug 2013 (Best poster award).
91. Lee KH, Lee PS. GBS mounted offshore nuclear power plant. The Second Joint SJTU-KAIST Research Symposium, Aug 2013.
92. Kim DG, Kim CH, Lee PS. Our challenge for the remote guidance of animal's moving path. International Conference on Advances in Robotics Research (ICARR13), Aug 2013.
93. Lee KH, Kim KT, Lee PS. A 3D hydroelastic analysis of floating liquid storage structures in water waves. The Seventh MIT Conference on Computational Fluid and Solid Mechanics, Jun 2013.
94. Lee Y, Lee PS. New 3-node isotropic shell finite elements based on the MITC method. Seventh MIT Conference on Computational Fluid and Solid Mechanics, Jun 2013.
95. Kim CH, Kim DG, Lee PS. On the general framework to remotely guide animal's moving path. The 8th Asian Biophysics Association (ABA) Symposium, May 2013.
96. Kim JY, Kim YY, Lee PS. Research trends of structural damage assessment against Tsunami (국내외 지진해일에 의한 구조물 피해 관련 연구동향), KAOSTS conference, May 2013.
97. Kim MG, Kim SG, Woo IG, Han JH, Lee PS, Lee JI. Preliminary studies of ocean smart construction and safety enhancement. International Congress on Advances in Nuclear Power Plants (ICAPP), Apr 2013.
98. Lee KH, Lee JI, Woo IG, Han JH, Lee PS. Concept design of SMART mounted on GBS. International Congress on Advances in Nuclear Power Plants (ICAPP), Apr 2013.
99. Kim JY, Yoon JS, Kim YY, Lee PS. Case study on damage of coastal structures from Tsunami (지진해일에 의한 연안구조물 피해사례 분석). KOSHAM conference, Feb 2013.
100. Lee PS, Lee KH, Lee K, Lee CH, Kim DG. Two challenges in ocean systems engineering. Invited in International forum on Electric Vehicle (IFEV), Oct 2012.
101. Yoon JS, Lee PS. Efficiency analysis of floating-type wave power generators. International Conference on Advances in Coupled Systems Mechanics (ACSM), 2012.
102. Lee K, Lee KH, Lee PS. A concept for offshore nuclear power plants (ONPP), US-Korea Conference, 2012.
103. Lee PS, Kim KT. On the hydroelastic analysis of floating structures. The First Joint SJTU-KAIST Research Symposium, Jun 2012.
104. Kim JG, Lee PS, Park KC. Mode selection criterion based on flexibility approach in component mode synthesis. The 53rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Material Conference, 2012.
105. Lee KH, Kim KT, Lee PS. Hydroelastic analysis of floating liquid storage structures (부유식 유체 저장 구조물의 유탄성해석). COSEIK conference-spring, 2012.
106. Cho SP, Jiwinangun GR, Yoon JS, Lee PS. Study on hydroelastic behavior of floating structures with hinge connections (힌지를 가지는 부유식 구조물의 유탄성거동 연구). COSEIK conference-spring, 2012.
107. Ko Y, Lee PS. Time integration analysis of rotating elastic bar problem (회전하는 탄성막대 문제의 시간적분 해석). COSEIK conference-spring, 2012.

108. Lee PS, Kim KT, Jiwinangun GR, Cho SP, Park KC. On the general hydroelastic analysis of floating structures in frequency domain (부유구조체의 주파수영역 유탄성해석에 관하여). Ship hydrodynamics research association conference, 2012.
109. Lee KH, Lee KH, Lee PS. A new concept of ocean nuclear power plant (ONPP). Korean Nuclear Society Autumn Meeting, 2011.
110. Choi KJ, Kim YY, Lee PS. Development of automatic ship-to-ship mooring system and its applications in ocean engineering. UT-KAIST Symposium, Aug 2011.
111. Kim CH, Kim DG, Lee S, Kim HG, Lee PS, Myung H. Development of a remote control system for a turtle. Gordon Research Conference, 2011.
112. Kim JG, Zi G, Lee PS. Development of design charts for very large floating structures. The 21st International Offshore and Polar Engineering Conference, 2011.
113. Kim KT, Kim JG, Lee PS, Park KC. Hydroelastic analysis of floating structures. The Sixth MIT Conference on Computational Fluid and Solid Mechanics, 2011.
114. Yoon K, Lee PS. Development of general beam finite elements with warping displacements. The Sixth MIT Conference on Computational Fluid and Solid Mechanics, 2011.
115. Kim JG, Kim KT, Lee PS. Study on hydroelastic analysis of floating plate structures (부유식 평판구조물의 유탄성해석 기술에 관한 연구). COSEIK conference-spring, 2011.
116. Yoon K, Lee PS. Developing general beam finite element with warping displacement (뒤틀림 변위를 고려한 일반 빔 유한요소의 개발). COSEIK conference-spring, 2011.
117. Kim KT, Lee PS, Park KC. Accuracy analysis of a hydroelastic model of a floating beam (부유식 유탄성 보 모델의 수렴성 연구). COSEIK conference-spring, 2011.
118. Lee Y, Choi CK, Lee PS. Development of an efficient 3-node plate bending element by using the Hellinger-Reissner functional (Hellinger-Reissner 범함수를 이용한 효율적인 3 절점 판 유한요소의 개발). COSEIK conference-spring, 2011.
119. Choi KJ, Kim YY, Kim SI, Lee GG, Chung H, Lee PS. Novel automatic ship-to-ship mooring system for container operations in open sea (해상에서의 컨테이너 작업을 위한 선박간 자동 계류 시스템). SNAK conference-fall, 2010.
120. Hong DC, Choi KJ, Lee PS. Time-mean drift forces and moments on a container ship and a mobile harbor floating side by side in waves (병렬계류된 컨테이너선과 모바일 하버에 작용하는 3 차원 시간평균 표류력에 관한 고찰). SNAK conference-fall, 2010.
121. Lee Y, Ma JS, Kim YY, Chung H, Lee PS. On the Motion of the Semi-submersible Mobile Harbor System. Advances in Interaction and Multiscale Mechanics, 2010.
122. Lee JH, Yoon SJ, Chung H, Lee PS. The conceptual design of semi-submersible type mobile harbor using axiomatic design principles (공리설계를 이용한 반잠수식 모바일하버의 개념설계). Korea Society of CAD/CAM Engineers Conference, 2010 (awarded).
123. Zi G, Lee SO, Kim JG, Lee PS, Lee SJ. Hydroelastic analysis of very large floating structure (초대형 부유식 해상구조물의 유탄성 거동 분석). KSCE Conference, 2008.
124. Noh HC, Lee PS, Kim IH. Random variable state: response variability and exact expression for Gaussian random variable (확률변수상태에서의 응답변화도와 정규분포에서의 정확해). KSCE Conference, 2007.

125. Lee PS, Lee JY, Lee YH. Static and dynamic elastoplastic large deformation analysis of 3D steel frame structures (강 프레임 구조물의 정적 및 동적 탄소성 대변형 해석을 위한 유한요소기법의 개발). KSSC Conference, 2006.
126. Lee PS, Zhang XH, McClure G. Development of a general three-dimensional L-section beam finite element for elastoplastic large deformation analysis and its application to the analysis of a transmission tower. Third MIT Conference on Computational Fluid and Solid Mechanics, 2005.
127. Park TH, Lee PS. Large deformation analysis of saturated porous media using Biot's model. Joint ASME/ASCE/SES Conference on Mechanics and Materials, 2005.
128. Lee PS, McClure G. A general 3D L-section beam finite element for elastoplastic large deformation analysis. The 20<sup>th</sup> Canadian Congress of Applied Mechanics, 2005.
129. Jeong YJ, Jung KH, Lee PS, Park SS, Hwang IS. Parameter study of sandwich steel-concrete composite structures (샌드위치식 강-콘크리트 복합구조체의 매개변수 및 거동특성 연구). COSEIK conference-fall, 2000.
130. Choi CK, Lee PS, Park YM. A 4-node non-conforming flat shell element with drilling DOF. ASCE Engineering Mechanics Conference, Baltimore, 1999.
131. Choi CK, Lee PS. A 4-node non-conforming flat shell element with drilling DOF (면내회전자유도를 가지는 4 절점 비적합 평면셸요소). COSEIK (Computational Structural Engineering Institute of Korea) conference, 27-34, Oct 1998.

#### Invited Lectures

1. Lee PS. 자동도킹시스템 개발 및 GBS 내진해석. 삼성중공업, Jun 2018.
2. Lee PS. Analysis of various fluid-structure interaction problems in ocean engineering (여러가지 해양공학 유체-구조 상호작용 문제의 수치해석). Korea Research Institute of Ships and Ocean Engineering (KRISO), Apr 2018.
3. Lee PS. 새로운 미래를 위한 도전. 해양경찰청 연구소, Oct 2017.
4. Lee PS. 선형/비선형 FEA 의 이해. MIDAS IT, Oct 2017.
5. Lee PS. 파랑하중을 고려한 부유식 구조물 유탄성 해석/설계/시공. 현대건설, Jun 2017.
6. Ko Y, Yoon JS, Lee PS. Finite element method for nonlinear analysis of shell structures (유한요소법을 이용한 셸 구조물의 비선형해석 기법). Korea Research Institute of Ships and Ocean Engineering (KRISO), Oct 2016.
7. Kim DS, Lee PS. 광 유전학 뇌신경 자극 기술을 이용한 생체 로봇 제어 시스템. ADD, Jul 2016.
8. Lee PS. Technology developments for future railways (미래 철도를 위한 기술개발). The First Wednesday Multidisciplinary Forum, Apr 2015.
9. Lee PS. Development state of free-software PADO for hydroelastic analysis (KAIST 유탄성해석 공개 소프트웨어 PADO 의 개발 현황). Korea Research Institute of Ships and Ocean Engineering (KRISO), Jan 2015.
10. Lee PS, Kim JM. Gravity based structures in ocean engineering (해양에서 GBS 구조물의 활용 및 기술동향). Samsung C&T, Aug 2014.
11. Lee PS. Development of PADO for hydroelastic analysis (유탄성해석 공개 소프트웨어 (freeware) "PADO"의 개발). Samsung Heavy Industries, Jul 2014.

12. Lee PS, Kim SH. Technology of blast resistant ocean structures (해양시스템의 폭발 방호구조 기술 소개). Research Institute of Industrial Science and Technology (RIST), Feb 2014.
13. Lee PS. Fluid-structure interaction problems in ocean engineering (해양에서 유체-구조 상호작용해석). Korea Institute of Ocean Science & Technology (KIOST), Nov 2013.
14. Lee PS. Research in very large floating structures and their hydroelastic analysis (초대형 부유식 구조물 연구동향 및 유탄성 해석 기술). Seminars on floating runway structures (부유식 철도 교량 기술을 활용한 융복합 해상 활주로 기술 세미나), Nov 2013.
15. Lee PS. Analysis of shell structures using ADINA. ADINA seminar, Nov 2013.
16. Lee PS. Civil engineering, challenge towards ocean. University of Seoul, Dec 2012.
17. Lee PS. On the hydroelastic analysis using the direct coupling method (Direct coupling method 를 이용한 유탄성해석 연구에 대하여). Korea Institute of Ocean Science & Technology (KIOST), Aug 2012.
18. Lee PS. Mobile ocean nuclear power system. Sejong University, Jun 2011.
19. Lee PS. Development of Mobile Harbor technology. Research Institute of Industrial Science and Technology (RIST), Nov 2009.
20. Lee PS. On the nonlinear FE analysis of steel frame structures. Research Institute of Industrial Science and Technology (RIST), 2007.
21. Lee PS. Inelastic large deformation analysis of steel towers. Korea Institute of Construction Technology, 2005.

## PATENTS

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### Applied

1. 미세먼지 저감을 위한 해양 분수 장치. 2019.
2. 폭발용접을 이용한 선체 부착 장치. 2016.
3. 진공 압축식 보관용 매트형 오일펜스. 2016.
4. Guiding apparatus for blockade of break-hole (내부 투입형 파공봉쇄 유도장치). 2016.

### Registered

1. Marine nuclear power plant and installation method of it (해양 원자력 발전플랜트 및 그 시공방법), 2019.
2. Marine nuclear plant using GBS hull and its installing method (GBS 선체를 이용한 해상 원자력 발전플랜트 및 설치방법). 2019.
3. Apparatus for blocking fluid outflow in vessel accident (선박 유체 유출사고 대응을 위한 파공봉쇄 장치), 2019.
4. Sensor apparatus and fence apparatus using the same (센서 장치와 이를 이용한 펜스 장치), 2018.
5. Method for controlling behavior of animals using object seeking behavior (오브젝트 탐닉행동을 활용한 동물행동 조절 방법), 2018.

6. Emergency power supply system and method for nuclear power plants (원자력발전소 비상전력 공급 시스템 및 그 방법), 2017.
7. Shock absorbing sandwich panel and method of manufacturing the same (충격흡수 샌드위치 패널 및 그 제조 방법). 2017. Korean Patent 10-1777602.
8. Nuclear fuel loading system and method in floating type nuclear plant (부유식 해양원전 핵연료 장전 시스템 및 방법). 2016. Korean Patent 10-1692778.
9. Modularized floating type nuclear plant system (모듈화된 부유식 해양원전 시스템). 2016. Korean Patent 10-1692777.
10. Sea floating wind generating deice with tidal adaptation (조류 순응형 해상 부유식 풍력발전장치). 2016. Korean Patent 10-1620900.
11. Apparatus for stopping fluid spillage in vessel accident and method using the same (선박 사고 시 유체유출 차단장치 및 방법). 2015. Korean Patent 10-1520815.
12. Mooring system for a vessel. 2014. European Patent 02450271.
13. Safety system of ocean system-integrated modular advanced reactor (해상 소형 원전용 안전시스템). 2014. Korean Patent 10-1433907.
14. Cooling system for nuclear power plant by using sea water (해수를 이용한 원전 비상냉각 시스템). 2014. Korean Patent 10-1433907.
15. Mooring system for a vessel and floating body and quay wall including the same. 2014. Chinese Patent 102464213.
16. Ship for installing sea wind power generator and method using the same (해상풍력 발전장치의 설치 방법 및 설치 선박). 2014. Korean Patent 10-1375143.
17. Method for constructing ship on the sea and connecting block used therein (해상에서 선박을 접합하는 방법 및 그 방법에 이용되는 연결블록). 2014. Korean Patent 10-1369799.
18. Module-structured marine nuclear power plant (모듈화된 해양원전 시스템). 2014. Korean Patent 10-1353556.
19. Apparatus and method for induction of animal moving (동물 이동 유도 장치 및 방법). 2013. Korean Patent 10-1339689.
20. Mooring system for a vessel. 2013. U.S. Patent 08499709.
21. Independently controlled multi-stage hydraulic cylinder and mooring system using the cylinder (독립 제어되는 다단 유압 실린더 및 이를 이용한 선박의 계류 시스템). 2012. Korean Patent 10-1206409.
22. Mooring system for a vessel and floating structure, mobile harbor and quay using it (선박의 계류 시스템, 이를 이용한 부유체, 이동항구 및 안벽). 2012. Korean Patent 10-1198829.
23. Docking apparatus with a variable fender (가변 펜더를 구비하는 접안 장치와 접안장치가 장착된 부유체 및 이동항구). 2012. Korean Patent 10-1184917.
24. Method and apparatus for control of a living thing (생물체 조종 방법 및 장치). 2012. Korean Patent 10-1141592.
25. Method and apparatus for movement control of a living thing (생물체 이동 조종 방법 및 장치). 2012. Korean Patent 10-1132619.



26. Loading and unloading equipment of a mobile harbor and method thereof (이동항구의 선적 및 하역장치와 이를 이용한 방법). 2012. Korean Patent 10-1125045.
27. Semi-submersible mobile harbor and method for transporting containers using the same (반잠수식 모바일하버 및 이를 이용한 화물 운송 방법). 2012. Korean Patent 10-1131573.
28. Mobile portal crane and vessel with the crane (모바일 포탈 크레인 및 이를 장착한 선박). 2012. Korean Patent 10-1112158.
29. Apparatus for controlling rolling for floating body (해상부유물의 동요 방지장치). 2012. Korean Patent 10-1138752.
30. Pure oxygen combustion system using heat exchange (열교환을 이용한 순산소 연소 시스템). 2011. Korean Patent 10-1103256.
31. Self-energy generating electrolytic protection system (자가 발전형 전기방식 시스템). 2011. Korean Patent 10-1040204.
32. Apparatus for connecting concrete blocks of a floating structure in sea (부유식 구조물의 블록간 연결장치). 2011. Korean Patent 10-1066396.
33. Continuous launching method of floating structure from land to sea (육상에서 해상으로 부유식 구조물 연속 진수). 2011. Korean Patent 10-1071646.
34. Concrete inner mold using an air pressure (공기압을 이용한 콘크리트 내부거푸집). 2011. Korean Patent 10-1029462.
35. Apparatus and the method for continuously connecting precast concrete blocks on the sea (프리캐스트 콘크리트 블록의 해상 연결장치 및 방법). 2011. Korean Patent 10-1009908.
36. Lock-up apparatus of ship with buoyant berth (부유식 접안시설용 선박 고정장치). 2011. Korean Patent 10-1054712.
37. A bridge structure of floating type (부유식 교량 구조). 2010. Korean Patent 10-0993631.
38. Apparatus for connecting floating structures in sea (해상에서의 부유식 구조물 연결장치). 2010. Korean Patent 10-0985138.
39. Mooring method enhancing the side retaining force of a floating structure (부유식 구조물의 횡 지지력 보강 계류방법). 2010. Korean Patent 10-0979256.
40. Construction method for floating structures in the sea (해상에서의 부유식 구조물 제작방법). 2010. Korean Patent 10-0973255.
41. A floating type structure and its constructing method responding to flood water level (홍수위에 대응 가능한 부유식 구조물 및 그 시공방법). 2010. Korean Patent 10-0972387.
42. Buoyancy maintaining method of floating concrete structure (부유식 콘크리트 구조물의 부력 유지방법). 2010. Korean Patent 10-0939821.
43. Falling down method of floating concrete block manufactured on the sea (해상 제작된 부유식 콘크리트 블록의 전도방법). 2009. Korean Patent 10-0903987
44. Manufacturing method of floating concrete block on the sea (부유식 콘크리트 블록의 해상제작방법). 2009. Korean Patent 10-0903986
45. Containing system using floating structure (부유식 저장시설). 2009. Korean Patent 10-0921438
46. Module type tuned mass damper (모듈형 동조질량감쇠기). 2008. Korean Patent 10-0829489

## ACTIVITIES

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### Journal Editing

1. Editorial Board Member, KSCE journal of Civil Engineering, 2017-.
2. Editor, Structural Engineering and Mechanics, 2011-.
3. Editor, Ocean Systems Engineering, 2011-.
4. Editorial Board Member, Computers & Structures, 2011-.
5. Editorial Board Member, Journal of Computational Structural Engineering Institute of Korea, 2010-2011.
6. Editorial Board Member, International Journal of Concrete Structures and Materials, 2009-2010.
7. Editorial Board Member, International Journal of Steel Structures, 2007-2009.
8. Editorial Board Member, KSCE journal of Civil Engineering, 2006-2009.

### Organizing Conferences & Symposiums

1. Co-chair, 2018 International Conference on Ocean Systems Engineering (ICOSE18). Aug 2018.
2. Co-chair, 2017 International Conference on Innovative Structural Engineering and Mechanics (ISEM17). Aug 2017.
3. Organizer, The third U.Tokyo-SJTU- KAIST symposium. Aug 2016.
4. Co-chair, 2016 International Conference on Advances in Coupled Systems Mechanics (ACSM16). Aug 2016.
5. Secretary General, 2016 World Congress on Advances in Civil, Environmental, and Material Research (ACEM16) / 2016 Structures Congress (Structures 16). Aug 2016.
6. Organizer, The second SJTU-U.Tokyo-KAIST symposium. Oct 2015.
7. Co-chair, 2015 World Congress on Advances in Aeronautics, Nano, Bio, Robotics and Energy (ANBRE15). Aug 2015.
8. Co-chair, 2015 International Conference on Innovative in Structural Engineering and Mechanics (ISEM2015). Aug 2015.
9. Secretary General, 2015 World Congress on Advances in Structural Engineering and Mechanics (ASEM15). Aug 2015.
10. Member of International Scientific Committee, ECCOMAS MSF 2015: The 2nd International Conference on Multi-scale Computational Methods for Solids and Fluids. Jun 2015.
11. Organizer, The first SJTU-U.Tokyo-KAIST symposium. Sep 2014.
12. Editorial board member, The 12<sup>th</sup> International Conference on Computational Structures Technology (CST2014). Sep 2014.
13. Co-chair, 2014 Int'l Conference on Advances in Coupled Systems Mechanics (ACSM14). Aug 2014.
14. Secretary General, 2014 World Congress on Advances in Civil, Environmental, and Materials Research (ACEM14). Aug 2014.
15. Co-chair, 2013 International Conference on Innovative in Structural Engineering and Mechanics (ISEM13). Sep 2013.
16. Secretary General, 2013 World Congress on Advances in Structural Engineering and Mechanics (ASEM13). Sep 2013.

17. Secretary General, 2013 World Congress on Advances in Nano, Biomechanics, Robotics and Energy Research (ANBRE13). Aug 2013.
18. Organizer, The second SJTU-KAIST symposium. Aug 2013.
19. Co-chair, 2012 International Conference on Advances in Coupled Systems Mechanics (ACSM12).
20. Secretary General, 2012 World Congress on Advances in Civil, Environmental, & Materials Research (ACEM12).
21. Organizer, The First SJTU-KAIST symposium. Jun 2012.
22. Co-chair, 2011 Conference of Steel & Composite Structures (ICSCS 2011).
23. Co-organizer, 2011 World Congress on Advances in Structural Engineering and Mechanics (ASEM11+).
24. Organizer of the mini-symposium "Fluid-structure interaction in ocean engineering", 2010 International Conference on Advances in Interaction and Multiscale Mechanics (AIMM10).
25. Co-organizer, 2010 International Conference on Advances in Interaction and Multiscale Mechanics (AIMM10).

### **Professional Associations**

1. Vice-president, Korea Association of Computational Mechanics (KACM), 2016-.
2. Member, Korean Society of Mechanical Engineers (KSME), 2015-.
3. Member, Korean Society of Hazard Mitigation (KOSHAM), 2013-.
4. Member, Korean Society of Noise and Vibration Engineering (KSNVE), 2013-.
5. Member, Society of Naval Architects of Korea (SNAK), 2013-.
6. Member, Korean Nuclear Society (KNS), 2013-.
7. Secretary, KNS-SNAK joint Committee for Ocean Nuclear Energy, 2014.
8. Member, VLFS (Very Large Floating Structures) Committee, Society of Naval Architects of Korea (SNAK), 2013.
9. Secretary, Ocean Nuclear Power Plant Committee, Korean Nuclear Society (KNS), 2012-2013
10. Member, Korean-American Scientists and Engineers Association (KSEA), 2012-
11. Member, American Institute of Aeronautics and Astronautics (AIAA), 2012-2013.
12. Member, Korea Concrete Institute (KCI), 2009-.
13. Member, Korean Society of Civil Engineers (KSCE), 1998-.
14. Member, Computational Structural Engineering Institute of Korea (COSEIK), 1997-.
15. Member, Korean Society of Steel Construction (KSSC), 1996-.
16. Member, Korea Construction Engineers Association, 1996-.
17. Member of technical committee, Korea Construction New-Technology Association, 2006 -2009.

### **TEACHING**

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- ME579, Renewable Ocean Energy System (Fall 2018)
- ME493, My ME – Career Planning for Mechanical Engineers (Fall 2018)
- MAE400, MAE401, Capstone Design (Spring 2017, Fall 2017, Spring 2018, Fall 2018)

- ME440, Engineering Design via FEM (Fall 2017)
- ME535, Finite Element Analysis of Structures (Fall 2009, Fall 2010, Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2018)
- ME532, Advanced Analysis of Solids and Structures (Spring 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2014, Spring 2018)
- ME523, Introduction to Fluid-Structure Interaction (Fall 2011, Spring 2013, Spring 2015, Spring 2017)
- ME670, Construction of Offshore Structures (Summer 2011)
- ME597, Introduction to Renewable Ocean Energy (Spring 2012)
- ME509, Engineering Mechanics for Ocean Systems (Spring 2010, Spring 2011)
- ME598, Human and Energy: A Challenging Pursuit from Ocean (Fall 2012, Spring 2013, Fall 2013, Spring 2014)
- ME403, Introduction to Naval Architecture and Ocean Engineering (Summer 2013)
- MAE231, Solid Mechanics (2016)

## RESEARCH PROJECTS

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- FSSI 를 고려한 GBS 동적 거동 평가 (PI, 2018, 2019)
- 해상 복합 발전 시스템 융합 설계 및 운영 지능화 고급트랙 (PI, 2018, 2019-)
- 정확한 골다공증 진단을 위해 DXA 영상의 3 차원 고해상도와 유한요소해석을 연계한 차세대 골밀도 측정기 개발 (2018, 2019-)
- Numerical methods for analysis of highly nonlinear multi-physics problems in ocean systems engineering (PI, 2018, 2019-)
- Development of IoT-based condition monitoring and intelligent self-diagnosis system for pump-turbines (2018, 2019-)
- 미래 해상 무인/자율 무기체계 개발방향 연구 (PI, 2018)
- 고정도 선체 블록 가상 제조 시스템 개발 (2017, 2018, 2019-)
- Implantable BMI technology for wireless brain monitoring and control (PI, 2017)
- 초대형 컨테이너선 축계-센터링 복합 해석 기술 개발 (PI, 2017)
- 파랑 시 부유식 궤도의 운동특성 예측을 위한 수조실험 (PI, 2017)
- Development of rapid response technology for oil spill prevention (2016, 2017-)
- Laboratory of near field under water explosion (PI, 2015, 2016, 2017-)
- Development of technologies and equipment for HNS (Hazardous and Noxious Substance) outflow disaster response (PI, 2015-)
- Core technology development of SMART mounted 100MWe floating-type NPP (PI, 2014-2017)
- Development of a three dimensional hydroelastic analysis tool for sloshing and floating wind turbines (PI, 2014-2017)
- Development of a floating type ocean wind power system with economic competitive edge (2014, 2015, 2016, 2017-)

- Developments for new concept design of offshore floating wind turbine and coupled dynamic analysis code (PI, 2014, 2015)
- Hydroelastic analysis of submerged tunnels under earthquake, wave and current (PI, 2013, 2014)
- Development of FEM modeling core (PI, 2013)
- Development of analysis technology for structural damage assessment against Tsunami (PI, 2012-2014)
- Development of FE models for accurate assembly in offshore floating dock (PI, 2012)
- Development of design technology of blast harden bulkheads (2012-2014)
- Development of a three dimensional hydroelastic analysis tool for floating structures (PI, 2011-2013)
- Advanced education track for infrasytems of ocean renewable energy (PI, 2011-2016)
- Remote control system for animals using behavior biology (PI, 2011)
- Development of automatic ship-to-ship docking system (PI, 2010)
- Development of shell finite elements for large displacement analysis (PI, 2010)
- Development of pressure vessels for CO2 carriers (PI, 2010)
- Remote guidance system for fish (PI, 2010)
- Development of computational procedures for nonlinear analysis of offshore structures and hydro-elastic analysis of floating structures (PI, 2009)

## GRADUATE SUPERVISION

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- Sojin Shin (신소진), MS 2018. Doctoral student at KAIST
- Hyounggyu Choi (최형규), MS 2018. Doctoral student at KAIST
- San Kim (김산). MS 2015. Ph.D 2019. KEPRI (KEPCO Research Institute)
- Jeong-Ho Kim (김정호). MS 2014. Ph.D 2018. KINS (Korea Institute of Nuclear Safety)
- Hoontae Jung (정훈태). MS 2017. Doctoral student at KAIST
- Dae-Gun Kim (김대건). Ph.D 2017. Post-doctoral researcher at KAIST
- Sung-Yun Kim (김성운). Ph.D 2017. Senior researcher at LS cable & system
- Chaemin Lee (이채민). MS 2017. Doctoral student at KAIST
- Hyung-Jun Park (박형준). MS 2017. Doctoral student at KAIST
- Joo-Seong Yoon (윤주성). Ph.D 2017. Researcher at KAERI (Korea Atomic Energy Research Institute)
- Yeongbin Ko (고영빈). MS 2013, Ph.D 2017. Post-doctoral researcher at KAIST
- Seung-Hwan Boo (부승환). Ph.D 2016. Assistant Professor at Korea Maritime and Ocean University
- Cheol-Hu Kim (김철후). Ph.D 2016. Researcher at NST (National Research Council of Science & Technology)
- Kang-Heon Lee (이강현). Ph.D 2016. Researcher at KAERI (Korea Atomic Energy Research Institute)

- Hyun-Duk Seo (서현덕). MS 2016. Doctoral student at KAIST
- Dong-Hwa Lee (이동화). MS 2016. Doctoral student at KAIST
- Jae-Min Kim (김재민). MS 2016. Samsung C&T Engineering & Construction
- Hyeong-Min Jeon (전형민). Ph.D 2015. Post-doctoral researcher at MIT (Massachusetts Institute of Technology)
- Kyungho Yoon (윤경호). MS 2011, Ph.D 2015. Post-doctoral researcher at Harvard University
- Youngyu Lee (이윤규). MS 2011, Ph.D 2015. Researcher at ADD (Agency for Defense Development)
- Sung-Ho Kim (김성호). MS 2015. Korean Navy
- Hyo-Jin Kim (김효진). MS 2015. Doctoral student at KAIST
- Jin-Gyun Kim (김진균). Ph.D 2014. Assistant Professor at Kyung Hee University
- Zhang Bilin. MS 2014. Researcher at HHI (Hyundai Heavy Industries)
- Byung-Do Lee (이병도). MS 2014. STX Offshore & Shipbuilding
- Seong-Pil Cho (조성필). MS 2013. Doctoral student at NTNU (Norwegian University of Science and Technology)
- Ki-Hwan Lee (이기환). MS 2012. Researcher at HHI (Hyundai Heavy Industries)
- Randi Gusto Jiwinangun. MS 2010. Doctoral student at DTU
- Ki-Tae Kim (김기태). MS 2011. Post-doctoral researcher at MIT (Massachusetts Institute of Technology)
- Jae-Seok Ma (마재석). MS 2011. Researcher at KIMST (Korea Institute of Marine Science & Technology Promotion)