



T.S. Jang

Curriculum Vitae

Education

- 1987–1991 **B.S.**, *Pusan National University*, Busan, Republic of Korea.
Department of Naval Architecture and Ocean Engineering
- 1991–1993 **M.S.**, *Seoul National University*, Seoul, Republic of Korea.
Department of Naval Architecture and Ocean Engineering
- 1993–1999 **Ph.D.**, *Seoul National University*, Seoul, Republic of Korea.
Department of Naval Architecture and Ocean Engineering

Ph.D. Thesis

Title *Application of the inverse theory to ill-posed two-dimensional ship hydrodynamic problems*

Supervisor Hang S, Choi, Ph.D., Prof.

Professional Experiences

- 01/2000–**JSPS Researcher**, *Institute of Industrial Science, University of Tokyo*, Tokyo, Japan, (JSPS: Japan Society for the Promotion of Science hosted by Ministry of Education, Culture, Sports, Science and Technology, Japan).
12/2001
- 01/2002–**Senior Researcher**, *Korea Research Institute of Ships & Ocean Engineering*, Daejeon, Republic of Korea.
09/2003
- 03/2006–**Vice-Director**, *MIT(Marine and Information Technology) Group for High-Added Value Ships and Offshore Structures for Deep Sea Resources Exploration(BK21)*, Pusan National University.
02/2013
- 12/2011–**Director**, *Arctic Engineering Research Center, The Korea Ship and Offshore Research Institute*, Pusan National University.
03/2016
- 10/2003–**Professor**, *Department of Naval Architecture and Ocean Engineering*, Pusan National University.
present

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- 08/2013–08/2014 **Visiting Professor**, *Wessex Institute of Technology, Southampton, UK.*
- 06/2017–02/2022 **Division Manager**, *Engineering Research Center(ERC); Industrial "Mathematics" Center(NRF-2017R1A5A1015722), Pusan National University.*
- 09/2019–08/2020 **Visiting Professor**, *Deep Ocean Engineering Research Center, Korea Research Institute of Ships & Ocean Engineering(KRISO).*

Academic Societies

- 2002–present **Member**, *The Korean Society of Ocean Engineers.*
- 2002–present **Member**, *The Society of Naval Architects of Korea.*
- 2012–2012 **Associate Members**, *The Royal Institution Of Naval Architects.*
- 2012–2015 **Member**, *International Ship and Offshore Structures Congress (ISSC), Environment Committee.*
- 2012–2015 **Committee Chairman**, *The Korea Ship and Offshore Structures Congress (KSSC), Environment Committee, The Society of Naval Architecture of Korea.*
- 2015–2015 **Scientific Board**, *International Conference on Ships and Offshore Structures.*

Technical Advisory Panels and Committees

- 2008–present **Advisory Committee**, *The Lloyd's Register Educational Trust Research Centre of Excellence, Pusan National University.*
- 2011–present **Advisory Committee**, *Korea Research Institute of Ships & Ocean Engineering.*
- 2012–2012 **Local Committee**, *Asian Wave and Tidal Energy Conference.*

Technical Societies

- 2007–2015 **Editorial Board Member**, *The Open Ocean Engineering Journal.*
- 2007–2015 **Editorial Board Member**, *The Open Hydrology Journal.*
- 2012–2013 **Editorial Board Member**, *Radical Journal of Mathematical Physics.*
- 2013–2014 **Editorial Board Member**, *American Journal of Applied Mathematics.*
- 2006–present **Editorial Board Member**, *Ships and Offshore Structures(SCIE Journal).*
- 2013–present **Editorial Board Member**, *Advanced Shipping and Ocean Engineering.*
- 2017–present **Editorial Board Member**, *International Journal of Oceanography & Aquaculture.*
- 2020–present **Editorial Board(Academic Editor)**, *Mathematical Problems in Engineering (SCIE Journal).*

Prizes and Honors

- 1991 **Graduation with honors**, *The Society of Naval Architects of Korea.*
- 1995 **USO Six Star Honorees**, *United Service Organizations.*

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Interests

I'm interested in developing a mathematical method for discovering a problem arising in fluid mechanics, water waves, floating body mechanics, and their combined inverse problems (regularization techniques to remedy the ill-posedness): system identification of offshore structures.

- Nonlinear (ocean) system identification (inverse problems)
- Techniques to remedy the ill-posedness
- Developing nonlinear numerical schemes for ODE & PDE
- Water waves and wave mechanics

Languages

English **Excellent**
Japanese **Excellent**
Korean **Native language**

Selected Articles

1. Jang, T. S. (2021). Pseudo-parameter Iteration Method (PIM): A semi-analytic solution procedure for nonlinear problems. *Communications in Nonlinear Science and Numerical Simulation*, 97, 105733.
2. Jang, T. S. & Sung, H. G. (2021). A new nonlinear theory of a piston-type wavemaker: the classical Boussinesq equations. *Applied Mathematical Modelling*, 91, 43-57.
3. Jang, T. S. (2021). A new solution approach to the Serre equations. *IMA Journal of Applied Mathematics*, 86(1), 30-57.
4. Ahmad, F., Jang, T. S., Carrasco, J. A., Rehman, S. U., Ali, Z., & Ali, N. (2018). An efficient iterative method for computing deflections of Bernoulli-Euler-von Karman beams on a nonlinear elastic foundation. *Applied Mathematics and Computation*, 334, 269-287.
5. Jang, T. S. (2018). A new functional iterative algorithm for the regularized long-wave equation using an integral equation formalism. *Journal of Scientific Computing*, 74(3), 1504-1532.
6. Jang, T. S. (2018). A regular integral equation formalism for solving the standard Boussinesq's equations for variable water depth. *Journal of Scientific Computing*, 75(3), 1721-1756.
7. Jang, T. S. (2018). An improvement of convergence of a dispersion-relation preserving method for the classical Boussinesq equation. *Communications in Nonlinear Science and Numerical Simulation*, 56, 144-160.
8. Jang, T. S. (2017). A new dispersion-relation preserving method for integrating the classical Boussinesq equation. *Communications in Nonlinear Science and Numerical Simulation*, 43, 118-138.
9. Jang, T. S. (2016). A new solution procedure for a nonlinear infinite beam equation of motion. *Communications in Nonlinear Science and Numerical Simulation*, 39, 321-331.
10. Jang, T. S. (2015). A new solution procedure for the nonlinear telegraph equation. *Commu-*

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nications in Nonlinear Science and Numerical Simulation, 29(1-3), 307-326.

11. Jang, T. S. (2014). An integral equation formalism for solving the nonlinear Klein-Gordon equation. *Applied Mathematics and Computation*, 243, 322-338.
12. Jang, T. S. (2014). Uniqueness and stability of the simultaneous detection of the nonlinear restoring and excitation of a forced nonlinear oscillation. *Applied Mathematics and Computation*, 228, 234-239.
13. Jang, T. S. (2013). A method for simultaneous identification of the full nonlinear damping and the phase shift and amplitude of the external harmonic excitation in a forced nonlinear oscillator. *Computers and Structures*, 120, 77-85.
14. Jang, T. S. (2013). A new semi-analytical approach to large deflections of Bernoulli-Euler-Karman beams on a linear elastic foundation: Nonlinear analysis of infinite beams. *International Journal of Mechanical Sciences*, 66, 22-32.
15. Jang, T. S., Baek, H., Choi, H. S., & Lee, S. G. (2011). A new method for measuring nonharmonic periodic excitation forces in nonlinear damped systems. *Mechanical Systems and Signal Processing*, 25(6), 2219-2228.
16. Jang, T. S. (2011). Non-parametric simultaneous identification of both the nonlinear damping and restoring characteristics of nonlinear systems whose dampings depend on velocity alone. *Mechanical Systems and Signal Processing*, 25(4), 1159-1173.
17. Jang, T. S., Baek, H., Han, S. L., & Kinoshita, T. (2010). Indirect measurement of the impulsive load to a nonlinear system from dynamic responses: Inverse problem formulation. *Mechanical Systems and Signal Processing*, 24(6), 1665-1681.

Refereed Science Citation Index (Expanded) Journal Articles

1. Jang, T. S. (2021). Pseudo-parameter Iteration Method (PIM): A semi-analytic solution procedure for nonlinear problems. *Communications in Nonlinear Science and Numerical Simulation*, 97, 105733
2. Jang, T. S. & Sung, H. G. (2021). A new nonlinear theory of a piston-type wavemaker: the classical Boussinesq equations. *Applied Mathematical Modelling*, 91, 43-57
3. Jang, T. S. (2021). A new solution approach to the Serre equations. *IMA Journal of Applied Mathematics*, 86(1), 30-57
4. Syngellakis, S., Park, J., Cho, D. S. & Jang, T. S. (2020). A numerical study on an infinite linear elastic Bernoulli-Euler beam on a viscoelastic foundation subjected to harmonic line loads. *Journal of Mechanical Science and Technology*, 34(9), 3587-3595
5. Ullah, M. Z. & Jang, T. S. (2020). An efficient numerical scheme for analyzing bioconvection in von-Kármán flow of third-grade nanofluid with motile microorganisms. *Alexandria Engineering Journal*, 59, 2739-2752
6. Jang, T. S. (2020). An integral equation formalism for integrating a nonlinear initial-boundary value problem for a Boussinesq equation. *Mathematical Problems in Engineering*, 2020, 6083128
7. Baek, H., Park, J., Jang, T. S., Sung, H. G., & Paik, J. K. (2020). Numerical investigation of

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- non-linear deflections of an infinite beam on non-linear and discontinuous elastic foundation, *Ships and Offshore Structures*, 15, 19-28
8. F. Ahmad, T.S. Jang, J.A. Carrasco, S.U. Rehman, Z. Ali. 2018. An efficient iterative method for computing deflections of Bernoulli–Euler–von Karman beams on a nonlinear elastic foundation, *Applied Mathematics and Computation*, 334, 269–287
 9. T.S. Jang. 2018. A regular integral equation formalism for solving the standard Boussinesq’s equations for variable water depth, *Journal of Scientific Computing*, 75(3), 1721-1756
 10. T.S. Jang. 2018. A new functional iterative algorithm for the regularized long-wave equation using an integral equation formalism, *Journal of Scientific Computing* 74(3), 1504-1532
 11. T.S. Jang. 2018. An improvement of convergence of a dispersion-relation preserving method for the classical Boussinesq equation, *Communications in Nonlinear Science and Numerical Simulation* 56, 144-160
 12. J. Park, H.G. Sung, F. Ahmad, S.H. So, S. Syngellakis, K.H. Jung, T.S. Jang. 2017. A numerical identification of excitation force and nonlinear restoring characteristics of ship roll motion, *Journal of Marine Science and Technology Taiwan* 25(4), 475-481
 13. F. Ahmad, M.Z. Ullah, T.S. Jang, E.S. Alaidarous. 2017. An efficient method for the static deflection analysis of an infinite beam on a nonlinear elastic foundation of one-way spring model, *Ships and Offshore Structures* 12(7), 963-970
 14. T.S. Jang. 2017. A new dispersion-relation preserving method for integrating the classical Boussinesq equation, *Communications in Nonlinear Science and Numerical Simulation* 43, 118-137
 15. T.S. Jang. 2016. A new solution procedure for a nonlinear infinite beam equation of motion, *Communications in Nonlinear Science and Numerical Simulation* 39, 321-331
 16. F. Ahmad, T.S. Jang, J. Park. 2015. Hong Gun Sung, Simultaneous detection of the nonlinear restoring and excitation of a forced nonlinear oscillation: an integral approach, *Journal of Marine Science and Technology*, 21(2), 240-250
 17. T.S. Jang. 2015. A new solution procedure for the nonlinear telegraph equation, *Communications in Nonlinear Science and Numerical Simulation* 29(1-3), 307-326
 18. T.S. Jang. 2015. A new mathematical procedure for simultaneous identification of the nonlinear damping and restoring characteristics based on acceleration measurements, *Ships and Offshore Structures* 10(4), 426-435
 19. T.S. Jang. 2014 An integral equation formalism for solving the nonlinear Klein-Gordon equation, *Applied Mathematics and Computation* 243, 322–338
 20. T.S. Jang. 2014 A general method for analyzing moderately large deflections of a non-uniform beam: an infinite Bernoulli-Euler-von Karman beam on a non-linear elastic foundation, *Acta Mechanica*, 225, 1967–1984
 21. T.S. Jang. 2014. Uniqueness and stability of the simultaneous detection of the nonlinear restoring and excitation of a forced nonlinear oscillation, *Applied Mathematics and Computation*, 228, 234-239
 22. T.S. Jang. 2013. A method for simultaneous identification of the full nonlinear damping

and the phase shift and amplitude of the external harmonic excitation in a forced nonlinear oscillator, *Computers and Structures*, 120(15), 77–85

23. T.S. Jang. 2013. A new semi-analytical approach to large deflections of Bernoulli-Euler-v. Karman beams on a linear elastic foundation: nonlinear analysis of infinite beams, *International Journal of Mechanical Sciences*, 66, 22-32
24. T.S. Jang, H.G. Sung. 2012. A new semi-analytical method for the non-linear static analysis of an infinite beam on a non-linear elastic foundation: a general approach to a variable beam cross-section, *International Journal of Nonlinear Mechanics*, 47(4), 132-139
25. S.W. Choi, T.S. Jang. 2012. Existence and uniqueness of non-linear deflections of an infinite beam resting on a non-uniform non-linear elastic foundation, *Boundary Value Problems* 2012, DOI:10.1186/1687-2770-2012-5
26. T.S. Jang, H.G. Sung, J.S. Park. 2012. A determination of an abrupt motion of the sea bottom by using snapshot data of water waves, *Mathematical Problems in Engineering* 2012, DOI:10.1155/2012/472575
27. T.S. Jang, H.S. Baek, M.C. Kim, B.Y. Moon. 2011. A new method for detecting the time-varying nonlinear damping in nonlinear oscillation systems: nonparametric identification, *Mathematical Problems in Engineering* 2011, DOI:10.1155/2011/749309
28. T.S. Jang. 2011. A novel method for the non-parametric identification of nonlinear restoring forces in nonlinear vibrations based on response data: a dissipative nonlinear dynamical system, *Ships and Offshore Structures*, 6(4), 257-263
29. S.K. Lee, T.H. Joung, S.J. Cheon, T.S. Jang, J.H. Lee. 2011. Evaluation of the added mass for a spheroid-type unmanned underwater vehicle by vertical planar motion mechanism test, *International Journal of Naval Architecture and Ocean Engineering*, 3(3), 174-180
30. T.S. Jang, H.S. Baek, H.S. Choi, S.G. Lee. 2011. A new method for measuring nonharmonic periodic excitation forces in nonlinear damped systems, *Mechanical Systems and Signal Processing*, 25(6), 2219-2228
31. T.S. Jang. 2011. Non-parametric simultaneous identification of both the nonlinear damping and restoring characteristics of nonlinear systems whose dampings depend on velocity alone, *Mechanical Systems and Signal Processing*, 25(4), 1159-1173
32. T.S. Jang, H.S. Back, J.K. Paik. 2011. A new method for the nonlinear deflection analysis of an infinite beam resting on a non-linear elastic foundation, *International Journal of Non-linear Mechanics*, 46(1), 339-346
33. T.S. Jang, S.H. Kwon, J.H. Lee. 2010. Recovering the functional form of the nonlinear roll damping of ships from a free-roll decay experiment: an inverse formulism, *Ocean Engineering*, 37(14,15), 1337-1344
34. T.S. Jang, H.S. Back, S.L. Han, T. Kinoshita. 2010. Indirect measurement of the impulsive load to a nonlinear system from dynamic responses: inverse problem formulation, *Mechanical Systems and Signal Processing* 24(6), 1665-1681
35. T.S. Jang, S.L. Han, T. Kinoshita. 2010. An inverse measurement of the sudden underwater movement of the sea-floor by using the time-history record of the water-wave elevation, *Wave Motion*, 47(3), 146-155

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36. T.S. Jang, S.H. Kwon, S.L. Han. 2009. A novel method for non-parametric identification of nonlinear restoring forces in nonlinear vibrations from noisy response data: a conservative system, *Journal of Mechanical Science and Technology*, 23(11), 2938-2947
37. T.S. Jang, S.L. Han. 2009. Numerical experiments on determination of spatially concentrated time-varying loads on a beam: an iterative regularization method, *Journal of Mechanical Science and Technology*, 23(10), 2722-2729
38. T.S. Jang, H.S. Choi, S.L. Han. 2009. A new method for detecting nonlinear damping and restoring forces in nonlinear oscillation systems from transient data, *International Journal of Non-linear Mechanics*, 44(7), 801-808
39. T.S. Jang, S.L. Han. 2009. A numerical investigation of the inverse problem of the wavemaker, *Ships and Offshore Structures*, 4(4), 315-321
40. T.S. Jang, H.G. Sung, S.L. Han, S.H. Kwon. 2008. Inverse determination of the loading source of the infinite beam on elastic foundation, *Journal of Mechanical Science and Technology*, 22(12), 2350-2356
41. T.S. Jang, S.L. Han. 2008. Application of Tikhonov's regularization to unstable water waves of the two-dimensional fluid flow: spectrum with compact support, *Ships and Offshore Structures*, 3(1), 41-47
42. S.H. Kwon, C.H. Kim, T.S. Jang. 2007. An identification of wave propagation based on a single-point measurement, *Ocean Engineering*, 34(10), 1405-1412
43. T.S. Jang, S.H. Kwon, B.J. Kim. 2007. Solution of an unstable axisymmetric Cauchy-Poisson problem of dispersive water waves for a spectrum with compact support, *Ocean Engineering*, 34(5,6), 676-684
44. T.S. Jang, S.H. Kwon, T. Kinoshita, B.J. Kim. 2007. A nonlinear wave profile correction of the diffraction of a wave by a long breakwater: fixed point approach, *Ocean Engineering*, 34(3,4), 500-509
45. T.S. Jang, S.H. Kwon, H.S. Choi. 2007. Nonlinear wave profiles of wave-wave interaction in a finite water depth by fixed point approach, *Ocean Engineering*, 34(3,4), 451-459
46. T.S. Jang. 2006. A fixed point approach to superposition of two wave trains in deep water: wave profiles with nonlinear amplitude dispersion, *Ships and Offshore Structures*, 1(4), 279-287
47. T.S. Jang, S.H. Kwon, B.J. Kim. 2006. Nonlinear wave interaction of three Stokes' waves in deep water: Banach Fixed Point Method, *Journal of Mechanical Science and Technology*, 20(11), 1950-1960
48. T.S. Jang, S.H. Kwon, B.J. Kim. 2006. On an improvement of a nonlinear iterative scheme for nonlinear wave profile prediction, *Ocean Engineering*, 33(11,12), 1552-1564
49. T.S. Jang, S.H. Kwon, S.H. Hwang. 2006. Application of an iterative method to nonlinear superposition of water wave problems: FFT and mathematical analysis, *Ship and Offshore Structures*, 1(2), 83-88
50. T.S. Jang, S.H. Kwon, T. Kinoshita. 2005. On the realization of nonlinear wave profiles by using the Banach fixed theorem: Stokes wave in a finite depth, *Journal of Marine Science*

and Technology, 10(4), 181-187

51. T.S. Jang, S.H. Kwon. 2005. Application of Nonlinear Iteration Scheme to the Nonlinear Water Wave Problem: Stokian Wave, *Ocean Engineering*, 32(14, 15), 1862-1872
52. T.S. Jang, T. Kinoshita, H. Yamaguchi. 2001. A new functional optimization method applied to pitch distribution of marine propeller, *Journal of Marine Science and Technology*, 6(1), 23-30
53. T.S. Jang, H.S. Choi, T. Kinoshita. 2000. Solution of an unstable inverse problem: wave source evaluation from observation of velocity distribution, *Journal of Marine Science and Technology*, 5(4), 181-188
54. T.S. Jang, T. Kinoshita. 2000. A minimization theory in Hilbert space and its application to two-dimensional cavity flow with a numerical study, *Journal of Marine Science and Technology*, 5(4), 176-180
55. T.S. Jang, H.S. Choi, T. Kinoshita. 2000. Numerical experiments on an ill-posed inverse problem for a given velocity around a hydrofoil by iterative and noniterative regularizations, *Journal of Marine Science and Technology* 5(3), 107-111
56. T.S. Jang, T. Kinoshita. 2000. An ill-posed inverse problem of a wing with locally given velocity data and its analysis, *Journal of Marine Science and Technology*, 5(1), 16-20

Korea Citation Index Articles

1. J. Park, S. So & T.S. Jang. 2020. Hydrodynamic force on the vertical wall of a portable water storage tank: nonlinear Peregrine model, *Korean Society of Hazard Mitigation*, 20(4), 121-126
2. J. Park, S. So & T.S. Jang. 2019. Investigation of hydrodynamic force in a portable water storage tank of reentrant bottom shape using nonlinear Peregrine model, *Korean Institute of Fire Science & Engineering*, 33(5), 61-65
3. S. So, J. Park, H.G. Sung & T.S. Jang. 2018. Reduction of hydrodynamic force acting on the vertical wall of a portable water storage tank by convex bottom design, *Fire Science and Engineering*, 32(6), 69-73
4. J. Park, S. So & T.S. Jang. 2018. A numerical investigation of hydrodynamic force acting on the vertical wall of a portable water storage tank using a linearized Peregrine's model, *Korean Institute of Fire Science and Engineering* 32(1), 76-80
5. S.M. Kang, J. Park & T.S. Jang. 2017. Numerical simulation of one-dimensional Madsen-Sørensen extended Boussinesq equations using Crowhurst-Zhenquan scheme, *Journal of Ocean Engineering and Technology* 31(5), 346-351
6. J. Park, S.H. So & T.S. Jang. 2017. A numerical study on hydrodynamic force affecting the vertical wall of a portable water storage tank, *Korean Institute of Fire Science and Engineering* 31(3), 49-53
7. T.S. Jang & J. Park. 2014. A numerical study on the simultaneous identification of excitation force and restoring characteristic in linear forced oscillation system, *Korean Society for Noise and Vibration Engineering* 24(12), 943-947

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8. J.H. Park, K.H. Kim, B.Y. Moon & T.S. Jang. 2011. Changes of mooring force due to structural modification of a barge ship, *The KSFM Journal of Fluid Machinery* 14(5), 44-50
9. T.S. Jang & S.L. Han. 2008. Tikhonov's Solution of Unstable Axisymmetric Initial Value Problem of Wave Propagation: Deteriorated Noisy Measurement Data, *Journal of Ocean Engineering and Technology* 22(4), 1-7
10. T.S. Jang. 2006. An Interacting wave profile of three trains of gravity waves on finite depth by Contraction method, *Journal of Ocean Engineering and Technology* 20(1), 43-47
11. S.K. Cho, S.Y. Hong & T.S. Jang. 2004. Experiment and Simulation Study on Performance Evaluation and Design of Fin-Stabilizer, *Journal of the Society of Naval Architects of Korea* 41(6), 1-7
12. T.S. Jang. 2003. On the Wave Source Identification of an Wave Maker Problem, *Journal of Ocean Engineering and Technology* 17(5), 19-24
13. T.S. Jang, D.H. Yoon, S.Y. Hong, K.D. Park & M.J. Song. 2003. A Study on Seakeeping of Container Ships, *Journal of the Society of Naval Architects of Korea* 40(3), 16-21
14. T.S. Jang & S.Y. Hong. 2002. A Study on an Optimized Constant Pitch Propeller, *Journal of Ocean Engineering and Technology* 16(3), 28-33
15. T.S. Jang & Hang.S. Choi. 1999. A Study on the Ill-posed Inverse Problem of Two-dimensional Waves due to Pressure Distribution Using Regularization Method, *Journal of the Society of Naval Architects of Korea* 36(4), 48-55

Non-Science Citation Index International Articles

1. J.K. Seo, S.Y. Bae, J.K. Paik, T.S. Jang. 2013. Numerical Methodology for Predicting the Nonlinear Elastic Deflection of Curved Beams and Plates Using Nonlinear Integral Equations, *Journal of Civil & Environmental Engineering*, 3(2), 100-131
2. J. Park, H. Bai & T.S. Jang. 2013. A numerical approach to static deflection analysis of an infinite beam on a nonlinear elastic foundation: one-way spring model, *Journal of Applied Mathematics*, 2013, doi.org/10.1155/2013/136358
3. T.S. Jang. 2013. A new simultaneous identification of the harmonic excitations and nonlinear damping of forced damped nonlinear oscillations: a parametric approach, *Journal of Applied Mathematics*, 2013, doi.org/10.1155/2013/754576
4. T.S. Jang, J.W. Son, S.L. Han, H.G. Sung, S.K. Lee, S.C. Shin. 2010. A numerical investigation on nonparametric identification of nonlinear roll damping moment of a ship from transient response, *The Open Ocean Engineering Journal*, 3, 100-107
5. T.S. Jang, T. Kinoshita. 2000. A minimization theory applied to minimization of drag of a two dimensional strut with cavity flow, *Journal of Institute of Industrial Science*, 52(8), 345-347
6. T.S. Jang, T. Kinoshita. 2000. An Optimization theory and its Application to CFD based Design for Marine Propeller behind Ship, *Journal of Institute of Industrial Science*, 52(8), 348-351

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Invited Workshop

1. T.S. Jang, "A new approach to the nonlinear damped equation(or telegraph equation)", *Workshop on Nonlinear Waves and Fluid Mechanics*, National Institute for Mathematical Sciences, Daejeon, Rep. of Korea 10-13/Aug/2015

International Conferences & Proceedings

1. Jinsoo Park, T.S. Jang. "Introducing Jang's DRP Method Applied to Water Waves", *2017 International Conference on Applied Sciences*. Hokkaido, Japan 19-21/Jan/2017
2. T.S. Jang. "A new approach to the classical Boussinesq equation: dispersion-relation preserving", *2017 Korean Society for Industrial and Applied Mathematics(2017 KSIAM) Spring Conference*. Seoul, Rep. of Korea 23-24/Jan/2017
3. Sung Bum Lee, T.S. Jang, Jinsoo Park, Byung Young Moon, Seung Keon Lee. 2015. "Structural analysis of substructure with jacket type and its application for 5MW offshore wind power generation", *The 17th Cross Straits Symposium on Energy and Environmental Science and Technology (CSS-EEST17)*, Kyushu, Japan 2-3/Dec./2015
4. Jinsoo Park, T.S. Jang, "Numerical studies on large deflections of nonlinear beam resting on one-way nonlinear spring model", *The 7th International Conference on Thin-Walled Structures*, The Korea Ship and Offshore Research Institute (KOSORI), Pusan National University, Busan, Rep. of Korea 28/Sep-02/Oct/2014
5. Jinsoo Park, T.S. Jang, S. Syngellakis, Hong Gun Sung, "A numerical scheme for recovering the nonlinear characteristics of a single degree of freedom structure: non-parametric system identification", *13th International Conference on Structures Under Shock and Impact*, Wessex Institute of Technology and University of Liverpool, New Forest, United Kingdom. 3-5/Jun/2014
6. Jinsoo Park, T.S. Jang, "A Numerical Experiments of an Infinite beam on A Nonlinear Elastic Foundation using Jang's Iterative Method", *International Conference Recent trends in Engineering & Technology (ICRET 2014)*, International Institute of Engineers, Batam Indonesia 13-14/Feb/2014
7. Jinsoo Park, GeunSoo Ryu, Kook Jin Jang, Seung Keon Lee, Taek Soo Jang, "A numerical investigation on recovering a nonlinear system: Tikhonov's stabilization", *Proceedings of 5th PAAMES and AMEC2012*, Taipei, Taiwan 10-12/Dec/2012
8. T.S. Jang, Jinsoo Park, B.Y. Moon, "A numerical study of nonlinear deflection of a beam on a nonlinear elastic foundation", *2011 International Conference on Meshless and Other Novel Computational Methods*, Nanjing, China 18-21/Apr/2011
9. T.S. Jang, Jinsoo Park, "On the Nonlinear Modeling of a Nonlinear Dynamical System", *2010 International Conference on Meshless and Other Novel Computational Methods*, Busan, Rep. of Korea 17-21/Aug/2010
10. S. Khanfir, K. Hasegawa, S.K. Lee, T.S. Jang, J.H. Lee, S.J. Cheon, "Mathematical Model for Manoeuverability and Estimation of Hydrodynamic Coefficients of Twin-Propeller Twin-Rudder", *Conference Proceedings The Japan Society of Naval Architects and Ocean Engineers*, Osaka, Japan 12-12/Nov/2008

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11. J.O. Nahm, H.D. Kang, J.Y. Chung, S.H. Kwon, T.S. Jang, S.L. Han, "Characteristics of Pressure Signal in Slamming Test", *Proceedings of International Conference on Violent Flows (VF-2007)*, Kyushu University, Fukuoka, Japan 20-22/Nov/2007
12. S.H. Kwon, C.H. Kim, T.S. Jang, "Propagation of Linear Dispersive Waves in the Time and Spatial Domain", *Proceedings of The 2nd Pan Asian Association of Maritime Engineering Societies and Advanced Maritime Engineering Conference*, Jeju, Rep. of Korea 18-20/Oct/2006

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1. K.J. Kim, J. Park, T.S. Jang. Numerical simulation of 1-D Beji-Battjes extended Boussinesq equations in slowly varying water depth, 2017 Proceedings of the Annual Spring Meeting, The Korean Society of Ocean Engineers, Busan, Rep. of Korea 19-20 Apr 2017
2. S.B. Lee, J. Park, T.S. Jang. Numerical simulation of Nwogu's 1D extended Boussinesq equations: slowly varying bottom. 2017 Proceedings of the Annual Spring Meeting, The Korean Society of Ocean Engineers, Busan, Rep. of Korea 19-20 Apr 2017
3. S.M. Kang, J. Park, T.S. Jang. Numerical simulation of 1D shallow water waves using Madsen-Sorensen extended Boussinesq equations on slowly varying. 2017 Proceedings of the Annual Spring Meeting, The Korean Society of Ocean Engineers, Busan, Rep. of Korea 19-20 Apr 2017
4. T.S. Jang. An Inverse Formalism for Simultaneous Modeling of Nonlinear Damping and Restoring in Nonlinear Oscillations, 2012년 제 47차 선박유체역학연구회 하계 발표회, The Korean Society of Ocean Engineers, Seoul, Rep. of Korea 31 Aug 2012
5. Jinsoo Park, T.S. Jang, K.J. Jang. 비선형 시스템의 비선형 감쇠 및 복원 동시 추정 수치해석: 다평방정식, 2012 Proceedings of the Annual Spring Meeting, The Society of Naval Architects of Korea, Daegu, Rep. of Korea 31 May-01 Jun 2012
6. Jinsoo Park, T.S. Jang, B.Y. Moon. A Study on the Identification of Non-Linear Roll Damping Characteristic: Rigid-hulled Inflatable Boat, 2011 Proceedings of the Annual Spring Meeting, The Society of Naval Architects of Korea, Busan, Rep. of Korea 02-03 Jun 2011
7. Jinsoo Park, J.H. Lee, T.S. Jang. Simultaneous nonparametric identification of nonlinear roll damping and restoring moment of a mobile harbor, 2010 동계선박설계연구회, The Society of Naval Architects of Korea, Mokpo, Rep. of Korea 26 Feb 2010
8. J.H. Lee, Jinsoo Park, S.K. Park, Hong Gun Sung, T.S. Jang, J.W. Son, An experimental study on identifying a ship's nonlinear damping moment from the measurement of the angular velocity, 2009 Proceedings of the Annual Autumn Meeting, The Korean Society of Ocean Engineers, Geoje, Rep. of Korea 22-23 Oct 2009
9. T.S. Jang, S.L. Han, J.H. Lee. Recovering loading distributions on the infinite beam on elastic foundation: the iterated Tikhonov's regularization. 2008 Proceedings of the Annual Autumn Meeting, The Society of Naval Architects of Korea, Changwon, Rep. of Korea 13-14 Nov 2008

Patents

- T.S. Jang, 세르 방정식의 새로운 해법, 10-2020-0185425, Rep. of Korea
- T.S. Jang, 부시네스크 방정식을 이용한 비선형 초기경계치 해법, 10-2020-0185422, Rep. of Korea

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- T.S. Jang, 표준 부시네스크 방정식을 이용한 가변 수심에서 전파하는 파랑의 분석방법, 10-2018-0025552, Rep. of Korea
- T.S. Jang, 적분방정식 정식화를 이용한 RLW 방정식의 함수 알고리즘 개발을 위한 방법, 10-2017-0119700, Rep. of Korea
- T.S. Jang, 모조 변수를 이용한 분산관계 보존의 성능을 향상시키기 위한 방법, 10-2017-0119726, Rep. of Korea
- T.S. Jang, 개선 부씨네스크 방정식 수치해석방법, 10-2017-0024861, Rep. of Korea
- T.S. Jang, 비선형 무한 보의 운동 해석방법, 10-2016-0077335, Rep. of Korea
- T.S. Jang, 적분법 접근을 통한 비선형 복원계수 및 외부 가진력 크기 추정방법, 10-2015-0185320, Rep. of Korea
- T.S. Jang, 가속도 측정 기반의 비선형 감쇠 특성 및 비선형 복원 특성 동시 추정방법, 10-2015-0161205, Rep. of Korea
- T.S. Jang, 비선형 텔레그래프 방정식 해석 방법, 10-2015-0106586, Rep. of Korea
- T.S. Jang, 비선형 클라인-고든 방정식의 적분방정식 방법을 이용한 해석 방법, 10-2014-0090096, Rep. of Korea
- T.S. Jang, 불연속 탄성지지대 위에 놓인 무한 보의 비선형 변형 해석방법, 10-2014-0085223, Rep. of Korea
- T.S. Jang, 반복하중을 받는 기계시스템의 비선형 복원 및 외부 주기 하중 크기의 추정방법, 10-2014-0032724, Rep. of Korea
- T.S. Jang, 불균일 보의 대변위 변형해석방법, 10-2014-0032721, Rep. of Korea
- T.S. Jang, One-way 스프링 모델을 사용한 비선형 탄성 지지대 위에 놓인 무한 보의 정적 변형 해석 방법, 10-2013-0056665, Rep. of Korea
- T.S. Jang, 정규화 기법을 이용한 강제시스템의 완전한 비선형 감쇠 및 외부 조화가진 특성 동시추정방법, 10-2013-0031655, Rep. of Korea
- T.S. Jang, 시스템의 비선형 감쇠 특성과 외부 가진력 동시추정방법, 10-2013-0020080, Rep. of Korea
- T.S. Jang, 무한 보의 대변형 추정을 위한 수치해석방법, 10-2013-0006681, Rep. of Korea
- T.S. Jang, 불균일 단면형상의 무한 보 변형특성 추정을 위한 비선형 반복법 적용 수치해석방법, 10-2012- 0079451, Rep. of Korea
- T.S. Jang, 비선형 운동시스템의 비선형 시변화 감쇠특성 추정을 위한 비파라메트릭 수치해석방법, 10-2012- 0032460, Rep. of Korea
- T.S. Jang, 응답데이터를 이용한 소산성 비선형 운동시스템의 비파라메트릭 수치해석방법, 10-2011-0146055, Rep. of Korea
- T.S. Jang, 수파의 순간측정 정보를 이용하여 해저의 충격 운동 추정 기법, 10-2011-0146053, Rep. of Korea
- T.S. Jang, 비선형 감쇠 시스템에서의 비조화적이고 주기적인 가진력 측정에 대한 새로운 방법 고안, 10-2011-0050716, Rep. of Korea
- T.S. Jang, 비파라메터방법에 의한 비선형 시스템의 속도 의존 비선형 감쇠 및 복원력 동시추정 방법 고안, 10-2011-0050714, Rep. of Korea

- T.S. Jang, Jinsoo Park, 비선형 탄성지대 상의 무한 보의 변형 추정 방법, 10-2010-0138059, Rep. of Korea
- T.S. Jang, Jinsoo Park, 비파라미터방법에 의한 선박의 비선형 횡요 감쇠 해석 장치 및 방법, 10-2010-0138067, Rep. of Korea

FUNDED RESEARCH PROJECTS

- Project title: Applied research on shallow water wave equations by using a semi-analytic method
 Sponsor: Busan (Republic of Korea) & Global Core Research Center for Ships and Offshore Plants(GCRC-SOP), Pusan National University
 P.I.: T.S. Jang
 Duration: 01/Mar/2020 - 28/Feb/2021
 Amount of support: \$24,800 (30,000,000 won)
- Project title: Analysis of nonlinear marine hydrodynamics via a new semi-analytic solution procedure: water wave and offshore structure
 Sponsor: National Research Foundation of Korea(NRF)
 Sponsor's Grant Number: NRF-2018R1D1A1B06049813
 P.I.: T.S. Jang
 Duration: 01/Jun/2018 - 31/May/2025
 Amount of support: \$311,800 (350,000,000 won)
- Project title: Finance-Fishery-Manufacture Industrial Mathematics Center on Big Data (F²M IMC)
 Sponsor: National Research Foundation of Korea(NRF), Advanced Research Center Program(Engineering Research Center, ERC))
 Sponsor's Grant Number: NRF-2017R1A5A1015722
 P.I.: H.M. Kim (as a core-researcher)
 Duration: 01/Jun/2017 - 28/Feb/2022
 Amount of support: \$4,225,978 (4,750,000,000 won)
- Project title: A new development of nonlinear solvers for nonlinear PDEs through the use of Green's functions: mathematics and engineering
 Sponsor: National Research Foundation of Korea(NRF)
 Sponsor's Grant Number: NRF-2015R1D1A1A01058542
 P.I.: T.S. Jang
 Duration: 01/Nov/2015 - 31/Oct/2018
 Amount of support: \$130,200 (150,471,000 won)
- Project title: The study on a new numerical scheme for the nonlinear partial differential equation arising in mathematical science and engineering
 Sponsor: Pusan National University
 Sponsor's Grant Number: 2016-418
 P.I.: T.S. Jang
 Duration: 01/Oct/2016 - 30/Sep/2017
 Amount of support: \$4,330 (5,000,000 won)

- Project title: A study on protein folding mechanism through inverse problem theory
 Sponsor: Pusan National University
 Sponsor's Grant Number: 2015-207
 P.I.: T.S. Jang
 Duration: 01/Oct/2015 - 30/Sep/2016
 Amount of support: \$4,330 (5,000,000 won)
- Project title: A nonlinear modeling of nonlinear damping and restoring characteristics in large motion systems : Simultaneous modeling
 Sponsor: Pusan National University
 Sponsor's Grant Number: 2011-0010090
 P.I.: T.S. Jang
 Duration: 01/May/2011 - 30/Apr/2016
 Amount of support: \$151,500 (175,000,000 won)
- Project title: The detection of damping characteristics and external loads in a forced bushing system
 Sponsor: Hyundai Motor Company
 P.I.: T.S. Jang
 Duration: 01/Nov/2012 - 31/Dec/2013
 Amount of support: \$41,150
- Project title: A nonlinear modeling of nonlinear damping and restoring characteristics in large motion systems : Simultaneous modeling
 Sponsor: Hyundai Motor Company
 P.I.: T.S. Jang
 Duration: 07/Jul/2011 - 06/Sep/2011
 Amount of support: \$26,000
- Project title: Simultaneous nonparametric identification of nonlinear roll damping and restoring moment of a mobile harbor
 Sponsor: Korea Advanced Institute of Science and Technology
 P.I.: T.S. Jang
 Duration: 01/Jun/2009 - 31/Dec/2009
 Amount of support: \$43,300

EDUCATIONAL ACTIVITIES

Graduate Degrees Supervised

- Beom-Joon Kim, M.S., 2006
- So-Lyoung Han, M.S., 2009
- J.H. Lee, M.S., 2010
- Jinsoo Park, M.S., 2013
- So Young Bae, M.S., 2013
- Hye-ree Bai, M.S., 2014
- Kijoong Kim, M.S., 2017

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- Sungbae L22, M.S., 2017
- Sang-Mook Kang, M.S., 2017
- Jinsoo Park, Ph.D., 2020

Graduate Courses

- Advanced Potential Theory, 2005
- Advanced Theory of Hydrodynamics, 2005-present
- Advanced Theory of Ocean Wave, 2013-present
- Advanced Theory of Numerical Analysis, 2019-present

Undergraduate Courses

- Ocean Engineering, 2003
- Ocean Wave Mechanics, 2003
- Applied Mathematics, 2003-2005
- Numerical Analysis, 2004
- Offshore Structural Design, 2004
- Advanced Potential Theory, 2004
- Ocean Environmental Engineering, 2004-2013
- Probability & Statistics, 2005-2007
- Calculus in Engineering, 2006-2019
- Engineering of Ocean Environment System, 2015
- Numerical Analysis, 2019-present
- Marine Hydrodynamics, 2019-present