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**Tomoki Takami**

**PERSONAL PROFILE**

**Affiliation:** Associate Professor, Graduate School of Maritime Sciences Faculty of Maritime Sciences, Kobe University

5-1-1 Fukaeminami-machi, Higashinada-ku, Kobe 658-0022, JAPAN

**Date of Birth:** January 30, 1986

**Nationality:** Japan

**EDUCATION**

**Period:** April 2016 – March 2019

**Degree:** Doctor of Naval Architecture and Ocean Engineering

**Research Topic:** Development of Coupled CFD-FEA Method for Ship Structural Load and Its Application to Extreme Value Prediction by FORM.

**University:** Osaka University

**Supervisor:** Prof. Kazuhiro Iijima

**Period:** April 2008 – March 2010

**Degree:** Master of Naval Architecture and Ocean Engineering

**Research Topic:** Development and application of ISUM plate element considering buckling under shear

**University:** Osaka University

**Supervisor:** Prof. Masahiko Fujikubo

**Period:** April 2004 – March 2008

**Degree:** Bachelor of Naval Architecture and Ocean Engineering

**Research Topic:** Development of Idealized Structural Unit Method (ISUM)

**University:** Osaka University

**Supervisor:** Prof. Masahiko Fujikubo

**EMPLOYMENT**

**April 2010 – March 2024:**

Researcher of Structural Analysis Research Group,

Structural Strength Evaluation Dept.,

National Maritime Research Institute,

National Institute of Maritime, Port and Aviation Technology

6-38-1 Shinkawa, Mitaka, Tokyo, 181-0004, Japan

**October 2019 – September 2020:**

Guest Researcher of Department of Mechanical Engineering, Technical University of Denmark, Denmark

**March 2024 –:**

Associate Professor at Graduate School of Maritime Sciences, Kobe University

5-1-1, Fukaeminamimachi, Higashinada-ku, Kobe, 658-0022, Japan

**RESEARCH EXPERIENCES**

**2016-present**:

* Development of Simulation Based Design (SBD) system for ship hull shape by adopting the reliability optimization theory on actual sea navigation performance and FSI analysis.
* Slamming and whipping prediction by using fluid structure interaction analysis method.
* Extreme value prediction of ship responses based on FORM.
* Time domain sea state estimation using measured ship responses.
* Extreme ship responses in nonlinear waves.
* Parameter identification of nonlinear wave-induced responses.

**Before 2016:**

* Study on high-lift composite sail by using imagery analysis method and fluid structure interaction analysis method.
* Assessment of water impact pressure by utilizing numerical simulation and dropping test.
* Model test and analysis on a damaged box girder under longitudinal bending moment.
* Ultimate strength evaluation for continuous stiffened panel under combined shear and thrust.
* Fatigue assessment of ship considering order of whipping load.
* Reliability based investigation of an effect of nonlinear wave load on structural failure probability of ship.

**RESEARCH INTERESTS**

Slamming/Whipping, Roll motion, Fluid structure interaction, Hydro-elastic response, Nonlinear roll motion, Response forecasting, Nonlinear wave, Reduced order modelling, Extreme value prediction, Sea state estimation

**SKILLS**

**Computer Programing:** Fortran, C, VBA, Java, Python, Matlab

**Tools/Methods:** MSC.Nastran, MSC.Marc, LS-DYNA, STAR-CCM+, MSC.Patran, Altair HyperMesh, Paraview, MeshLab, Rhinoceros, Windows, Ubuntu, Linux, Mac OS, MS Office package

**Languages:** Japanese, English

**PUBLICATIONS**

**Journal publications**

1. Takami, T. and Kitahara, M. (2025): Active Learning-Based Estimation of Extreme Roll Motion in Beam Seas with Supervised Dimensionality Reduction and Gradient Approximation, ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering (**submitted for possible publication**)
2. Takami, T. and Kitahara, M. (2025): Equivalent Design Waves for Ship Responses by Active Learning Kriging and FORM, Probabilistic Engineering Mechanics (**submitted for possible publication**)
3. Chen, X., Okada, T., Kawamura, Y., Takami, T., and Oka, M. (2025): Uncertainty Assessment of Ship Transfer Functions Arising from Numerical Methods and Variability in Actual Operational Conditions, Ocean Engineering (**accepted**)
4. Nielsen, U.D., Mounet, R.E.G., and Takami, T. (2025): An exact algorithm for spectral calculations of wave-induced ship responses, Ocean Engineering, Vol. 340, Part 2, 122183.
5. Takami, T., Nielsen, U.D., Mounet, R.E.G., Jensen, J.J., Mori, R., and Komoriyama, Y. (2025): Blind Identification of Incident Waves and Response Transfer Functions of a Marine Vessel Based on Measured Responses, Expert Systems with Applications (**accepted**)
6. Takami, T., Kitahara, M., Maki, A., and Dostal, L. (2025): Uncertainty-aware Efficient Estimation of Probability Density Function for Excessive Rolling of a Ship, ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering (**accepted**)
7. Takami, T., Kitahara, M., Jensen, J.J., and Matsui, S. (2025): Extreme Nonlinear Ship Response Estimations by Active Learning Reliability Method and Dimensionality Reduction for Ocean Wave, Marine Structures, 99, 103725.
8. Takeda, K., Yanagimoto, F., Ota, D., Takami, T., Kuroda, T., Ishibashi, K., Umeda, N. (2024): Validation of Operational Guidance for Parametric Roll Based on the Extended Grim’s Effective Wave Theory in the Light of Model Experiments and 6-DOF Simulation, Journal of Marine Science and Technology (**submitted for possible publication**)
9. Takami, T., Takeda, K., Yanagimoto, F., Ishibashi, K., Ota, D., Umeda, N. (2024): Experimental Validation of FORM-based Parametric Rolling Prediction, Journal of Marine Science and Technology (**submitted for possible publication**)
10. Chen, X., Takami, T., Oka, M. (2024): Uncertainty Analysis Method for Estimating Wave Parameters Based on Ship Responses (3rd Report- The representation method of the transfer function for the log-normal distribution by principal component analysis) (in Japanese), Journal of the Japan Society of Naval Architects and Ocean Engineers, Vol. 40, pp.145-156.
11. Takami, T., Nielsen, U.D., Jensen, J.J., Maki, A., Matsui, S., and Komoriyama, Y. (2024): Onboard Identification of Stability Parameters Including Nonlinear Roll Damping via Phase-resolved Wave Estimation Using Measured Ship Responses, Mechanical Systems and Signal Processing, Vol. 210, 15 March 2024, 111166.
12. Chen, X., Takami, T., Oka, M. (2024): Uncertainty Analysis Method for Estimating Wave Parameters Based on Ship Responses (2nd Report- Representation of Uncertainty in Transfer Function Using Principal Component Analysis), (in Japanese), Journal of the Japan Society of Naval Architects and Ocean Engineers, Vol. 38, pp. 75-83.
13. Chen, X., Takami, T., Oka, M., Kawamura, Y., and Okada, T. (2024): Uncertainty Analysis Method for Estimating Wave Parameters Based on Ship Responses -1st Report- Influence of the Ship Speed and Uncertainty in the measurement data, (in Japanese), Journal of the Japan Society of Naval Architects and Ocean Engineers, Vol. 38, pp. 65-74.
14. Nielsen, U.D., Bingham, H.B., Brodtkorb, A.H., Iseki, T., Jensen, J.J., Mittendorf, M., Mounet, R.E.G., Shao, Y., Storhaug, G., Sørensen, A.J., and Takami, T. (2023): Estimating Waves Via Measured Ship Responses, Scientific Reports, 13, 17342.
15. Takami, T., Fujimoto, W., Houtani, H., and Matsui, S. (2023): Combination of HOSM and FORM for Extreme Wave-induced Response Prediction of a Ship in Nonlinear Waves, Ocean Engineering,Vol.286, Part 2, 15, 115643.
16. Takami, T., Nielsen, U.D, Jensen, J.J., and Chen, X. (2023): Estimation of Encountered Wave Elevation Sequences Based on Response Measurements in Multi-directional Seas, Applied Ocean Research, 135, 103570.
17. Chen, X., Takami, T., Oka, M., Kawamura, Y., and Okada, T. (2023): Stochastic Wave Spectra Estimation (SWSE) Based on Response Surface Methodology Considering Uncertainty in Transfer Functions of a ship, Marine Structures, 90, 103423.
18. Takami, T., Nielsen, U.D., Chen, X., Jensen, J.J., Oka, M. (2022): Reconstruction of Incident Wave Profiles Based on Short-Time Ship Response Measurements, Applied Ocean Research 123 (2022) 103183.
19. Pal, S.K., Ono, T., Takami. T., Tatsumi, A., Iijima, K. (2022): Effect of Springing and Whipping on Exceedance Probability of Vertical Bending Moment of a Ship, Ocean Engineering, Volume 266, Part 1, 15, 112600.
20. Takami, T., Ma, C. (2022): Surrogate Model Approach for Stochastic Prediction of Sloshing-induced Pressure Based on SPH with FORM, Ships and Offshore Structure, Vol18, 2, pp..143-156.
21. Takami, T., Jensen, J.J., and Nielsen, U.D. (2022): Short-Time FORM Analysis for Extreme Roll Motion Prediction in Beam Seas, Marine Structures 82 (2022) 103160.
22. Takami, T., Nielsen, U.D, and Jensen, J.J. (2021): Real-time Deterministic Prediction of Wave-induced Ship Responses Based on Short-time Measurements, Ocean Engineering Volume 221, 1, 108503.
23. Takami, T., Nielsen, U.D, and Jensen, J.J. (2020): Estimation of Autocorrelation Function and Spectrum Density of Wave-induced Responses Using Prolate Spheroidal Wave Functions, Journal of Marine Science and Technology, 26, pp. 772–791.
24. Takami, T., Iijima, K., and Jensen, J.J. (2020): Extreme Value Prediction of Nonlinear Ship Loads by FORM Using Prolate Spheroidal Wave Functions, Marine Structures 72C (2020) 102760.
25. Takami, T., Komoriyama, Y., Ando, T., Ozeki, S., and Iijima, K. (2020): Efficient FORM Based Extreme Value Prediction of Nonlinear Ship Loads with an Application of Reduced Order Model for Coupled CFD and FEA, Journal of Marine Science and Technology 25(2), 327-345.
26. Takami, T. and Iijima, K. (2019): Numerical Investigation into Combined Global and Local Hydroelastic Response in a Large Container Ship Based on Two-way Coupled CFD and FEA, Journal of Marine Science and Technology 25(2), 346-362.
27. Oka, T., Takami, T., and Ma, C. (2018): Estimation of Wave Loads acted on Ships in Service based on AIS Data. - Evaluation of Operational Effects on the Maximum Loads. - (in Japanese), Journal of the Japan Society of Naval Architects and Ocean Engineers, Volume 28, pp.89-97 (awarded).
28. Takami, T., and Iijima, K. (2018): Derivation of Design Irregular Wave for Assessing Vertical Strength of a Ship Considering Double Bottom Bending (in Japanese), Journal of the Japan Society of Naval Architects and Ocean Engineers, Volume 28, pp.111-120.
29. Takami, T., Matsui, S., Oka, M., and Iijima, K. (2018): A numerical simulation method for predicting global and local hydroelastic response of a ship based on CFD and FEA coupling, Marine Structures, Volume 59, pp.368-386.
30. Takami, T., Yamada, Y., and Oka, M. (2012): A Consideration about the Applicability of Fluid-Structure Interaction Analysis to Water Impact Issues (in Japanese), Journal of the Japan Society of Naval Architects and Ocean Engineers, Volume 16, pp.99-107 (awarded).

**Conference proceedings**

1. Mounet, R.E.G., Nielsen, U.D, and Takami, T., (2025): Doppler Shift Approximation in Seakeeping Problems: A New Formulation for Ships Advancing at Any Forward Speed, PRADS2025.
2. Takami, T., Nielsen, U.D., Mounet, R.E.G., Jensen, J.J., and Komoriyama, Y. (2025): Concurrent Estimation of Ship Transfer Functions and Incoming Waves by Using Response Measurements, PRADS2025.
3. Nielsen, U.D, Mounet, R.E.G., and Takami, T., (2025): Exact spectral calculations of wave-induced ship responses considering arbitrary speed-heading combinations in short-crested waves, PRADS2025.
4. Komoriyama, Y., Houtani, H., Takami, T., Matsui, S., and Fujimoto, W. (2024): Tank Test of Flexible Acrylic Ship Model in Waves for Extreme Response Prediction, Proceedings of the ASME 2024 43rd International Conference on Ocean, Offshore and Arctic Engineering, OMAE2024.
5. Takami, T., Nielsen, U.D., Jensen, J.J., and Matsui, S. (2023): Nonlinear Roll Damping Identification Based on Onboard Ship Response Measurements, Proceedings of 10th PAAMES and AMEC 2023. (no peer review)
6. Takami, T., Fujimoto, W., Houtani, H., and Matsui, S. (2023): Extreme Wave and Vertical Bending Moment Predictions by Higher Order Spectrum Method and FORM, Proceedings of the ASME 2023 42nd International Conference on Ocean, Offshore and Arctic Engineering OMAE2023.
7. Takami, T., Nielsen, U.D, and Jensen, J.J. (2022): Application of Prolate Spheroidal Wave Functions for Assessment and Prediction of Ship Responses, PRADS2022.
8. Takami, T., Ma, C. (2021): Extreme Tank Force Prediction by FORM Using Time Domain Numerical Simulation Based on SPH, Proc. of ISOPE2021.
9. Takami, T., Ozeki, S., and Iijima, K. (2019): On the Assessment of Extreme Wave-induced Bending Moment of a Ship by FORM and Reduced Order Method Based on Coupled CFD and FEA, PRADS2019.
10. Oka, M., Takami, T., and Ma, C. (2019): Evaluation method for the maximum wave load based on AIS and hindcast wave data, PRADS2019.
11. Ichinose, Y., Tahara, Y., Takami, T., Kaneko, A., Masui, T., and Arai, D. (2019): A Study of Multi-objective Optimization for Propulsion Performance and Cargo Capacity, PRADS2019.
12. Takami, T., Komoriyama, Y., Ando, T., and Iijima, K. (2019): Experimental Assessment of FORM Based Approach for Predicting Extreme Value Distribution of Hull Girder Bending Moment in a Ship, Proceedings of the ASME 2019 38th International Conference on Ocean, Offshore and Arctic Engineering (OMAE2019).
13. Iijima, K., Nabeshima, R., Kinugawa, K., Takami, T., and Fujikubo, M. (2018): Extreme Value Distribution of Combined Hull Girder and Double Bottom Bending Moments in a Container Ship by FORM, Proceedings of 32nd Asian-Pacific Technical Exchange and Advisory Meeting on Marine Structures (TEAM2018). (no peer review)
14. Tahara, Y., Ichinose, Y., Takami, T., and Kaneko, A. (2018): Simulation Based Global Concept and Local Geometry Optimization for Ship Design Considering Propulsive Performance in Actual Seas and Fatigue Damage Evaluation by Using Global Oceanographic Model and Onboard Monitored Data, 32nd Symposium on Naval Hydrodynamics.
15. Takami, T., Oka, M., Ichinose, Y., Kaneko, A., Tahara, Y., Arai, D., Masui, T., and Mizutani, N. (2018): Fatigue Damage Assessment Based on Actual Sea State Estimated from On-board Monitored Data, 7th International Maritime Conference on DESIGN FOR SAFETY.
16. Takami, T. and Iijima, K. (2018): Numerical Method to Estimate Fluid-Structure Interaction Effect of Ships under Severe Wave Condition, Proceedings of 37th International Conference on Ocean, Offshore and Arctic Engineering (OMAE2018).
17. Takami, T. and Iijima, K. (2018): Extreme Value Prediction of Whipping Response of a Ship by FORM Based on Coupled CFD and FEA Simulations, 3rd International Conference on Safety and Reliability of Ships, Offshore & Subsea Structures (SAROSS2018). (no peer review)
18. Takami, T., Oka, M., and Iijima, K. (2017): Development of CFD and FEA coupling method and its application to hydro-elastic response estimation, Proceedings of 31st Asian-Pacific Technical Exchange and Advisory Meeting on Marine Structures (TEAM2017). (no peer review)
19. Takami, T., Oka, M., and Iijima, K. (2017): Study on Application of CFD and FEM Coupling Method to Evaluate Dynamic Response of Ship under Severe Wave Condition, Proceedings of 36th International Conference on Ocean, Offshore and Arctic Engineering (OMAE2017).
20. Yamada, Y., Takami, T., and Ozawa, T. (2016): Experimental and Numerical Study of Damaged Box Girders under Longitudinal Bending Moment, Proceedings of the 20th International Offshore and Polar Engineering Conference (ISOPE2016).
21. Ogawa, H., Takami, T., Tatsumi, A., Tanaka, Y., Hirakawa, S., and Fujikubo, M. (2016): Buckling/Ultimate Strength Evaluation for Continuous Stiffened Panel under Combined Shear and Thrust, Proceedings of 35th International Conference on Ocean, Offshore and Arctic Engineering (OMAE2016).
22. Takami, T., Oka, M., and Ma, C. (2016): Study on Evaluation of Structural Response Caused by Slamming Impact using CFD, Proceedings of 3rd International Conference on Violent Flows (VF-2016). (no peer review)
23. Takami, T., Ogawa, H., Miyata, T., Ando, T., Tatsumi, A., Hirakawa, S., Tanaka, Y., and Fujikubo, M. (2015): Study on Buckling/Ultimate Strength of Continuous Stiffened Panel under In-plane Shear and Thrust, Proceedings of the 19th International Offshore and Polar Engineering Conference (ISOPE2015).
24. Fujikubo, M., Tatsumi, A., Iijima, K., Ogawa, H., and Takami, T. (2014): Boundary Condition for Buckling/Plastic Collapse Analysis of Continuous Stiffened Panel under Combined Thrust and Inplane Shear, Proceedings of the ICTWS 2014 7th International Conference on Thin-Walled Structures ICTWS2014. (no peer review)
25. Fujikubo, M., Uda, S., Tatsumi, A., Iijima, K., Ogawa, H., and Takami, T. (2013): Finite element modeling of a continuous stiffened panel under combined inplane shear and thrust, Proceedings of 27st Asian-Pacific Technical Exchange and Advisory Meeting on Marine Structures (TEAM2013). (no peer review)
26. Yamada, T., Takami, T., and Oka, M. (2012): Numerical Study on the Slamming Impact of Elastic Stiffened Wedge considering Fluid-Structure Interaction (FSI), Proceedings of the 16th International Offshore and Polar Engineering Conference (ISOPE2012).
27. Oka, M., Takami, T., and Ogawa, Y. (2011): A study of design loads for fatigue strength utilizing direct calculation under real operational conditions, Advances in Marine Structures