

TRAN THANH TUAN

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JOB OBJECTIVE

Conducting research on the development and enhancement of structural designs to improve their durability and performance against natural hazards

EDUCATION

09/2016 - 02/2020 Kunsan National University, South Korea, Ph.D., Structural/Earthquake Engineering

09/2010 - 11/2013 Ho Chi Minh City University of Technology, Viet Nam, M.S, Structural/Earthquake Engineering

09/2004 - 03/2009 Ho Chi Minh City University of Technology, Viet Nam, B.S, Civil Engineering

EMPLOYMENT HISTORY

03/2020 - present **Research Fellow**
Institute of Offshore Wind Energy, Kunsan National University (South Korea)

09/2016 - 02/2020 **PhD research assistant**
Department of Civil Engineering, Kunsan National University (South Korea)

05/2010 - 10/2022 **Lecturer**
Faculty of Technology and Technique, Quy Nhon University (Vietnam)

HONORS AND AWARDS

- (1) Best paper award from Nuclear Engineering and Technology journal (2022)
- (2) Excellent paper award on 10th Asia-Pacific Forum on Renewable Energy (AFORE) international conference (2021).
- (3) Outstanding graduate student award from Brain Korea 21+ (BK 21), Government grand of South Korea (2019).
- (4) Best presentation award on Korea Institute for Structural Maintenance and Inspection (KSMI) conference (2018).
- (5) Scholarship for Outstanding Vietnamese students form CG Engineering, South Korea (2017).
- (6) University Scholarship during PhD courses for excellent academic performance, KSNU, South Korea.
- (7) Excellent academic scholarship during bachelor course (2008).

RESEARCH EXPERIENCE

Institute of Offshore Wind Energy, Kunsan National University (South Korea)

Research fellow

1. *Project: Development of IoT-based monitoring system for offshore wind*
Cooperated with Spec Engineering and DOT, 2022-2024
 - Development of smart safety evaluation technology for offshore wind power support structures using digital twin technology

2. *Project: A Study on Structural Safety Improvement of L-Type Bolt Joint for Wind Tower*
Funded by Korea Research Foundation (KRF), 2021-2023
 - Development of technology to improve structural safety of L-type bolt joint for wind power
3. *Project: A study to increase structural safety of flange joint for wind tower*
Funded by Korea Electric Power Corporation (KEPCO), 2021-2022
 - Reducing the stress concentration in the bolt
 - Increasing the strength resistance of flange joint
 - Setting experimental tests (coupon test, torque test and tensile test) for L-type flange joint

Dept. Civil and Environmental Engineering, Kunsan National University (South Korea)

Ph.D research assistant

1. *Project: Development of probabilistic site response analysis program for earthquake response analysis*
Funded by Korea Electric Power Corporation (KEPCO), 2017-2018
 - Methodology survey and related design criteria survey
 - Development of soil damping relationship and probabilistic variable extraction algorithm for probabilistic site response analysis
 - Developed the probabilistic model for uncertainty quantification of soil properties using advanced simulation methods (Monte Carlo simulation)
2. *Project: Development the procedure to evaluate the seismic performance of the cabinet facilities*
Funded by Korea Institute of Energy Technology Evaluation and Planning (KETEP) and the Ministry of Trade, Industry & Energy of Korea(MOTIE), 2017-2021
 - Undertook qualitative and quantitative risk assessments of specified structures (NPPs, OWT) subjected to earthquakes.
 - Developed the probabilistic model for uncertainty quantification of nuclear facilities using advanced simulation methods (i.e, random field)
 - Developed framework for seismic performance of nuclear facilities
 - Assessed vulnerability, damage, and risk assessments of structures
3. *Other works*
 - Consultant works on design ground motion for structures and infrastructures based on code specifications

TEACHING EXPERIENCE

- Lecturer: Construction Engineering
- Supervisor: Final Year Project for undergraduate students

SKILLS

Structural analysis software

- SACS, ANSYS (Mechanical, Aqwa, Twin Builder), OpenSees, Bladed, Etabs, Sap2000

Language programs

- MATLAB, Python, Tcl/Tk, VBA

Experimental test

- Coupon test, Torque test, Tensile test

Testing equipment

- Ultrasonic Test Machine, Hydraulic Torque Machine

ACHIVEMENTS

Practical guidelines

Developing a series of practical guidelines for design of fixed offshore wind turbines (tower, L-type flange joint, monopile, grout connection, etc)

- **Thanh-Tuan Tran** and Daeyong Lee, (2022), Design Guideline for Wind Turbine Support Structure - Tower Shell - A Primer For Structural Engineers, Hanul Media, South Korea.
- **Thanh-Tuan Tran** and Daeyong Lee, (2022), Design Guideline for Wind Turbine Support Structure - L-type Flange Joint - A Primer For Structural Engineers, Hanul Media, South Korea.
- **Thanh-Tuan Tran** and Daeyong Lee, (2022), Design Guideline for Wind Turbine Support Structure - Monopile - A Primer For Structural Engineers, Hanul Media, South Korea.

Book

- Lan Thi Pham, **Tuan Thanh Tran**, (2016), Civil Engineering Drawings Practice. Construction publishing house – ministry of construction, Viet Nam (in Vietnamese).

Softwares/Tools

- Vibration control for Offshore Wind Turbine - VC4OWT (MATLAB)
- Korea Seismicity Map - KSMAP (PYTHON)
- Probabilistic Site Response Analysis - pSHAKE (PYTHON)
- Modelling and Simulation of Uncertainty using Random Field Approach- UQSSL (in progress)

PUBLICATIONS

Peer-review journal papers

A total of 19 publications (15 Q1 + 4 Q2), of which 15 are first author

- **Tran, T. T.**, Kang, S., & Lee, D. (2022). Improving Structural Safety of L-Type Flange Joint for Wind Towers. *Energies*, 15(23), 8967.
- **Tran, T. T.**, & Lee, D. (2022). Understanding the behavior of l-type flange joint in wind turbine towers: Proposed mechanisms. *Engineering Failure Analysis*, 142, 106750.
- **Tran, T. T.**, Kim, E., & Lee, D. (2022). Development of a 3-legged jacket substructure for installation in the southwest offshore wind farm in South Korea. *Ocean Engineering*, 246, 110643.
- **Tran, T. T.**, & Lee, D. (2022). Development of jacket substructure systems supporting 3MW offshore wind turbine for deep water sites in South Korea. *International Journal of Naval Architecture and Ocean Engineering*, 14, 100451.
- Nguyen, P. C., **Tran, T. T.**, & Nghia-Nguyen, T. (2021). Nonlinear time-history earthquake analysis for steel frames. *Heliyon*, 7(8), e06832.
- **Tran, T. T.**, Le, T. M. T., Nguyen, P. C., Kim, D., Pham, T. M., Salman, K., & Chang, S. (2021). Probabilistic Seismic Demand Model and Seismic Fragility Analysis of NPP Equipment Subjected to High-and Low-Frequency Earthquakes. *Nuclear Science and Engineering*, 1-20.
- **Tran, T. T.**, Kang, S., Lee, J. H., & Lee, D. (2021). Directional Bending Performance of 4-Leg Jacket Substructure Supporting a 3MW Offshore Wind Turbine. *Energies*, 14(9), 2725.
- **Tran, T. T.**, Salman, K., & Kim, D. (2021). Distributed plasticity approach for nonlinear analysis of nuclear power plant equipment: Experimental and numerical studies. *Nuclear Engineering and Technology*.

- **Tran, T. T.**, Hussan, M., Kim, D., & Nguyen, P. C. (2020). Distributed plasticity approach for the nonlinear structural assessment of offshore wind turbine. *International Journal of Naval Architecture and Ocean Engineering*, 12, 743-754.
- **Tran, T. T.**, Cao, A. T., Kim, D., & Chang, S. (2020). Seismic Vulnerability of Cabinet Facility with Tuned Mass Dampers Subjected to High-and Low-Frequency Earthquakes. *Applied Sciences*, 10(14), 4850.
- **Tran, T. T.**, Nguyen, P. C., So, G., & Kim, D. (2020). Seismic behavior of steel cabinets considering nonlinear connections and site-response effects. *Steel and Composite Structures*, 36(1), 17-29.
- **Tran, T. T.**, Salman, K., Han, S. R., & Kim, D. (2020). Probabilistic Models for Uncertainty Quantification of Soil Properties on Site Response Analysis. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 6(3), 04020030.
- Kashif Salman, **Thanh-Tuan Tran** & Dookie Kim (2020) Seismic capacity evaluation of NPP electrical cabinet facility considering grouping effects, *Journal of Nuclear Science and Technology*, DOI: 10.1080/00223131.2020.1724206
- Cao, A. T., **Tran, T. T.**, Nguyen, T. H. X., & Kim, D. (2019). Simplified Approach for Seismic Risk Assessment of Cabinet Facility in Nuclear Power Plants Based on Cumulative Absolute Velocity. *Nuclear Technology*, 1-15.
- Salman, K., **Tran, T. T.**, & Kim, D. (2020). Grouping effect on the seismic response of cabinet facility considering primary-secondary structure interaction. *Nuclear Engineering and Technology*, 52(6), 1318-1326.
- **Tran, T. T.**, & Kim, D. (2019). Uncertainty quantification for nonlinear seismic analysis of cabinet facility in nuclear power plants. *Nuclear Engineering and Design*, 355, 110309.
- **Tran, T. T.**, Cao, A. T., & Kim, D. (2019). Fragility assessment for electric cabinet in nuclear power plant using response surface methodology. *Nuclear Engineering and Technology*, 51(3), 894-903.
- **Tran, T. T.**, Han, S. R., & Kim, D. (2018). Effect of probabilistic variation in soil properties and profile of site response. *Soils and Foundations*, 58(6), 1339-1349.
- **Tran, T. T.**, Nguyen, T. H., & Kim, D. (2018). Seismic incidence on base-isolated nuclear power plants considering uni-and bi-directional ground motions. *Journal of Structural Integrity and Maintenance*, 3(2), 86-94.

Presentations (oral)

- **Tran, T. T.** & Lee, D. (2022) Design Of L-Type Flange Joint For Wind Tower. Autumn KWEA conference, Jeju, South Korea, (2021.11.14~15).
- **Tran, T. T.** & Lee, D. (2022) Redesign of L-Flange Joint for 5MW Wind Tower. 2022 Convention conference and civil EXPO , BPEX, Busan, South Korea, (2022.10.19~10.21).
- **Tran, T. T.** & Lee, D. (2021) Ultimate Load Capacity Assessment of the L-type Flange Connection of An Existing 5MW Wind Tower. Asia-Pacific Forum on Renewable Energy (AFORE) , Ramada Plaza, Jeju, South Korea, (2021.10.31~11.03).
- **Tran, T. T.** & Lee, D. (2021) Effects of Flange Gap on the Structural Performance of Bolted Flange Joint for Wind Turbine. Spring KWEA conference, Jeju, South Korea, (2021.7.5~7).
- **Tran, T. T.**, Kim, E., Lee, J. & Lee, D. (2021) Development of Pre-piled Jacket Substructures Supporting 3MW Wind Turbine at Different Sea Water Depths. Spring KWEA conference, Jeju, South Korea, (2021.7.5~7).
- **Tran, T. T.**, Cao, A. T., Nguyen, P. C., & Kim, D. (2021). Influences of Ground Motion Frequency on the Seismic Vulnerability of Nonstructural Components. In *Structural Health Monitoring and Engineering Structures* (pp. 543-549). Springer, Singapore.
- **Tran, T. T.** & Lee, D. (2020). A Study on Dynamic Response of 4-Leg Jacket Structures under Different Sea Water Levels. Autumn KWEA conference, Jeju, South Korea, (2021.11.16~18).
- **Tran, T. T.** & Lee, D. (2020). Influence of Incident Wave/Wind Direction on Dynamic Response of 4-legged Jacket Substructures. KSCE 2020 convention, Jeju, South Korea, (2021.10.21~23).

- **Tran, T. T.**, Cao, A. T., Salman, K., Nguyen, P. C., & Kim, D. (2020). Experimental and numerical modal analysis of cabinet facility considering the connection nonlinearity. In ICSCEA 2019 (pp. 1093-1100). Springer, Singapore.
- **Tran, T. T.**, Nguyen, P. C., Han, S. R., & Kim, D. (2020). Stochastic Site Response Analysis in Consideration with Various Probability Distributions of Geotechnical Properties. In CIGOS 2019, Innovation for Sustainable Infrastructure (pp. 901-906). Springer, Singapore.

PROFESSIONAL MEMBERSHIP

- Energies (https://www.mdpi.com/journal/energies/submission_reviewers)
- Sustainability
- Buildings
- ETASR (Engineering, Technology & Applied Science Research)
- JMSE (Journal of Marine Science and Engineering)
- JSIM (Journal of Structural Integrity and Maintenance)
- Natural Hazards Research
- Frontier in Marine Science
- Applied Sciences

SYNERGISTIC ACTIVITIES

Invited

- Speaker at technical seminar, “Technical Seminar on Design and Construction of Nearshore and offshore Wind Turbines”, hosted by FECON corporation (2022)

Graduate/undergraduate students mentored

- Mentored 2 students in 2019 Fall for Master program in Ho Chi Minh City University of Technology.
- Mentored undergraduate students from 2010 to 2016 for Bachelor program in Quy Nhon University.

RESEARCH INTERESTS

- Structural dynamics with application in earthquake and wind engineering.
- Structural reliability and its application (i.e. failure probabilities, safety indicators).
- Digital twin technology and application in structures.