Taisei **Saida**

Ph.D Student in Engineering, University of Tsukuba

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1-1-1 Tennodai, Tsukuba-shi, 305-8573, Ibaraki, Japan

Education

Current – Apr. 2023 | **University of Tsukuba** — **Ibaraki, Japan**
Ph.D. in Engineering | Degree Program in Engineering Mechanics & Energy

Mar. 2023 – Apr. 2021 | **University of Tsukuba** — **Ibaraki, Japan**
Master in Engineering | Degree Program in Engineering Mechanics & Energy

Dec. 2021 – Apr. 2017 | **University of Tsukuba** — **Ibaraki, Japan**
Bachelor of Engineering | College of Engineering Systems

Experience

Mar. 2026 – Apr. 2024 | **JSPS Research Fellowship DC2** — **Japan**
Japan Society for the Promotion of Science

Sep. 2023 – Jun. 2023 | **Research Internship** [🌐] — **CA, US**
Lawrence Livermore National Laboratories, *Mentor: Dr. Aldair Ernesto Gongora*

Sep. 2021 – Sep. 2021 | **Research Internship** [🌐] — **Kanagawa, Japan**
Taisei Company Technology Center

Sep. 2021 – Aug. 2021 | **Research Internship** [🌐] — **Ibaraki, Japan**
NTT Access Network Service Systems Laboratories

Current – Jun. 2021 | **Research Assistant** [🌐] — **Ibaraki, Japan**
AIS Lab in University of Tsukuba

Dec. 2022 – May. 2019 | **Research Assistant** [🌐] — **Ibaraki, Japan**
National Agriculture and Food Research Organization

Journal Papers

[7] **ExSRNet: Explainable deep learning model for seismic response prediction with frequency attention mechanism** [doi]
Taisei Saida, Mayuko Nishio
Engineering Structures. 2025; 343; 120953; [ELSEVIER ES'25]

[6] **Optical Flow-Based Structural Anomaly Detection in Seismic Events From Video Data Combined With Computational Cost Reduction Through Deep Learning** [doi]
Sifan Wang, Taisei Saida, Mayuko Nishio
Structural Control and Health Monitoring. 2025; 4702519; [WILEY SCHM'25]

[5] **System fragility analysis of highway bridge using multi-output Gaussian process regression surrogate model** [doi]
Taisei Saida, Muhammad Rashid, Mayuko Nishio
Advances in Structural Engineering. 2024; 27(16); 2803-2822. [SAGE ASE'24]

[4] **TL-GPRSM: A python software for constructing transfer learning Gaussian process regression surrogate model with explainability** [doi]
Taisei Saida, Mayuko Nishio
Software Impacts. 2023; 16; 100515. [ELSEVIER SIMPA'23]

[3] **Transfer learning Gaussian process regression surrogate model with explainability for structural reliability analysis under variation in uncertainties** [doi]
Taisei Saida, Mayuko Nishio
Computers & Structures. 2023; 281; 107014. [ELSEVIER CAS'23]

[2] **CNN-based segmentation frameworks for structural component and earthquake damage determinations using UAV images** [doi]
Taisei Saida, Muhammad Rashid, Yudai Nemoto, Shota Tsukamoto, Takehiko Asai, Mayuko Nishio
Earthquake Engineering and Engineering Vibration. 2023; 22(2); 359-369. [**SPRINGER EEEV'23**]

[1] **CONSTRUCTION OF GAUSSIAN PROCESS REGRESSION SURROGATE MODEL FOR NONLINEAR SEISMIC RESPONSE ANALYSIS USING ARD KERNEL (in Japanese)** [doi]
Taisei Saida, Mayuko Nishio
Journal of Japan Society of Civil Engineers, Ser. A2 (Applied Mechanics (AM)). 2021; 77(2); I_93-I_104. [**JSCE AM'21**]

Conference Papers

[4] **Seismic Fragility Assessment using Explainable Deep Kernel Learning Surrogate Model considering Structural and Seismic Uncertainties** [doi]
Taisei Saida, Mayuko Nishio
IABSE Reports. 2025; 121; 2581-2589. [**IABSE'25**]

[3] **Gaussian Process Regression Surrogate Model for Seismic Vulnerability Assessment of Highway Bridge Structure System** [doi]
Taisei Saida, Muhammad Rashid, Mayuko Nishio
Lecture Notes in Civil Engineering. 2023; 433; 520-529. [**EVACES'23**]

[2] **Digital twin framework for real-time dynamic analysis visualization with detecting dynamic changes in structures properties using PINN** [doi]
Toko Okuda, Taisei Saida, Mayuko Nishio
Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2023. 2023; 12486; 1248616. [**SPIE'23**]

[1] **Gaussian process regression surrogate model for dynamic analysis to account for uncertainties in seismic loading** [doi]
Taisei Saida, Mayuko Nishio
Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2023. 2023; 12486; 124861O. [**SPIE'23**]

Awards

[4] **Poster Award** [🌐]
The JSCES Summer Student Symposium 2024.
The Japan Society for Computational Engineering and Science, 2024.

[3] **Meikeikai Awards** [🌐]
This award is given to those who have done outstanding research.
Meikeikai in University of Tsukuba, 2023.

[2] **Honorable Mention** [🌐]
The 2nd International Competition for Structural Health Monitoring
ANCRiSST, 2022.

[1] **Applied Mechanics Presentation Award** [🌐]
The 24th Symposium on Applied Mechanics
Japan Society of Civil Engineers, 2021.

Grants

[4] **Multidisciplinary Cooperative Research Program (MCRP-2025)** [🌐]
2025-2026, 8190 (Miyabi-G) and 1800 (Miyabi-C) node-hour product
Center for Computational Sciences in University of Tsukuba

[3] **Research Fellowship for Young Scientists (DC2)** [🌐]
2024-2026, 200,000 JPY/m and 1,600,000 JPY
Japan Society for the Promotion of Science

[2] **SPRING : Support for Pioneering Research Initiated by the Next Generation Home** [🌐]
2023-2026, 200,000 JPY/m and 1,500,000 JPY
Japan Science and Technology Agency

[1] **JASSO Scholarship for Top 10% Excellent Master Students** [🌐]
2023, 2,112,000 JPY
Japan Student Services Organization

International Conferences

[7] **Seismic Fragility Assessment using Explainable Deep Kernel Learning Surrogate Model considering Structural and Seismic Uncertainties**
Taisei Saida, Mayuko Nishio
IABSE Symposium Tokyo 2025 **[IABSE'25]**

[6] **Learning particle method simulation for solid and fluid mechanics**
Mayuko Nishio, Gen Matono, Taisei Saida
16th symposium on Discovery, Fusion, Creation of New Knowledge by Multidisciplinary Computational Sciences: Program of Parallel sessions **[CCS'24]**

[5] **A seismic response prediction surrogate model with engineering explainability using attention-embedded CNN**
Taisei Saida, Mayuko Nishio
16th World Congress on Computational Mechanics & 4th Pan American Congress on Computational Mechanics **[WCCM'24]**

[4] **Gaussian Process Regression Surrogate Model for Seismic Vulnerability Assessment of Highway Bridge Structure System** [doi]
Taisei Saida, Muhammad Rashid, Mayuko Nishio
10th International Conference on Experimental Vibration Analysis for Civil Engineering Structures **[EVACES'23]**

[3] **Gaussian process regression surrogate model for dynamic analysis to account for uncertainties in seismic loading** [doi]
Taisei Saida, Mayuko Nishio
SPIE Smart Structures + NDE 2023 **[SPIE'23]**

[2] **Digital twin framework for real-time dynamic analysis visualization with detecting dynamic changes in structures properties using PINN** [doi]
Toko Okuda, Taisei Saida, Mayuko Nishio
SPIE Smart Structures + NDE 2023 **[SPIE'23]**

[1] **Gaussian Process Regression Surrogate Modeling with Transfer Learning for Low Computational Cost Structural Reliability Analysis**
Taisei Saida, Mayuko Nishio
15th World Congress on Computational Mechanics & 8th Asian Pacific Congress on Computational Mechanics **[WCCM'22]**

Domestic Conferences

[17] **[キーノート講演] 転移学習を用いた深層学習モデルによる観測データを基にした構造物地震応答の予測**
才田 大聖, 西尾 真由子
第 *30* 回計算工学講演会, *2025.*

[16] **周波数領域での解釈性を有する構造物地震応答予測モデルの観測データによる学習（シンポジウム講演概要）**
才田 大聖, 西尾 真由子
第 *28* 回応用力学シンポジウム, *2025.*

[15] **[優秀ポスター賞受賞] Attention 機構を周波数領域に適用する説明性のある地震応答代替モデルの構築**
才田 大聖, 西尾 真由子
JSCES 夏季学生講演会 *2024, 2024.*

[14] **周波数領域への Attention 機構適用による説明性のある地震応答代替モデルの構築**
才田 大聖, 西尾 真由子
令和 *6* 年度全国大会 第 *79* 回年次学術講演会, *2024.*

[13] **AttentionCNN を用いた工学的説明性の高い地震応答予測サロゲートモデルの構築**
才田 大聖, 西尾 真由子
第 *29* 回計算工学講演会, *2024.*

[12] **高次元不確定性を扱う構造信頼性解析への正則化深層カーネル学習サロゲートモデル構築（シンポジウム講演概要）**
才田 大聖, 西尾 真由子
第 *27* 回応用力学シンポジウム, *2024.*

[11] **深層カーネル学習代替モデルによる高架橋システムの地震フラジリティ解析**
才田 大聖, Muhammad Rashid, 西尾 真由子
第 *10* 回構造物の安全性･信頼性に関する国内シンポジウム, *2023.*

[10] **[招待講演] 橋梁の地震フラジリティ解析効率化のためのガウス過程回帰代替モデル構築**
才田 大聖
JSCES 夏季学生講演会 *2023*, *2023.*

[9] **[招待講演] 高次元不確定性を扱う構造信頼性解析を効率化するガウス過程ベース代替モデル構築**
才田 大聖
計算工学会 マルチメソッド・新数値解析手法開拓研究会 第 *5* 回研究会, *2023.*

[8] **PINN 構造振動解析の AR によるリアルタイム可視化**
奥田 東子, 才田 大聖, 的野 玄, 西尾 真由子
第 *28* 回計算工学講演会, *2023.*

[7] **SPH 法に基づく微分演算を内包した深層学習による粒子法代替モデルの説明性向上**
的野 玄, 才田 大聖, 西尾 真由子
第 *28* 回計算工学講演会, *2023.*

[6] **深層カーネル学習サロゲートモデルによる高次元不確定性をもつ構造信頼性解析の効率化**
才田 大聖, Muhammad Rashid, 西尾 真由子
第 *28* 回計算工学講演会, *2023.*

[5] **地震荷重特徴抽出を備えた深層カーネル学習代替モデルによる地震リスク解析の効率化（シンポジウム講演概要）**
才田 大聖, 西尾 真由子
第 *26* 回応用力学シンポジウム, *2023.*

[4] **転移学習ガウス過程回帰代替モデルによる構造性能解析の計算負荷低減**
才田 大聖, 西尾 真由子
令和 *4* 年度土木学会全国大会 第 *77* 回年次学術講演会, *2022.*

[3] **転移学習ガウス過程回帰サロゲートモデルによる構造性能解析の計算負荷低減**
才田 大聖, 西尾 真由子
第 *27* 回計算工学講演会, *2022.*

[2] **ARD カーネルによる非線形地震応答解析のガウス過程回帰代替モデル構築**
才田 大聖, 西尾 真由子
第 *26* 回計算工学講演会, *2021.*

[1] **[応用力学講演賞受賞] ARD カーネルによる非線形地震応答解析のガウス過程回帰代替モデル構築**
才田 大聖, 西尾 真由子
第 *24* 回応用力学シンポジウム, *2021.*

Peer Reviews

2025
Reliability Engineering & System Safety | 1 review

Engineering Structures | 4 reviews

Evolutionary Intelligence | 1 review

Expert Systems | 1 review

2024
Reliability Engineering & System Safety | 3 reviews

Measurement | 1 review

Earth Science Informatics | 1 review

2023
Reliability Engineering & System Safety | 2 reviews