

Zhiwei Zhang

The 3rd year Ph.d. Student, Kumamoto University, Kumamoto, Japan

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RESEARCH INTERESTS

1. Travel Survey Methods, 2. Travel Behavior Analysis, 3. Discrete Choice Models, 4. Transportation Policy Analysis, 5. Complex Network Science in Transportation, 6. Latent Class Analysis, 7. Impact of Built Environment on Travel Demand, 8. Spatio-temporal Dynamics of Urban Functional Zones.

EDUCATION

Kumamoto University Kumamoto, Japan
Ph.D. in Engineering Apr 2024 - Mar 2027

Thesis Title: The Identification and Correction Framework for Trip Underreporting Bias in Household Travel Surveys. (Tentative)

Kumamoto University Kumamoto, Japan
Master of Engineering in Urban Planning and Regional Design Apr 2022 - Mar 2024

Thesis Title: Enhanced Adapted PageRank Algorithm Based on Temporal-modal Dual Coupling Effect in Multi-modal Mobility Network.

Fujian University of Technology Fuzhou, China
Bachelor of Engineering in Transportation Planning and Management Sep 2017 - Jun 2021

Thesis Title: Research on Traffic Safety of Electric Bicycle in Cangshan Wanda Plaza Area of Fuzhou City.

RESEARCH EXPERIENCE

Detection and correction framework for trip misreporting bias in household travel surveys Kumamoto, Japan
Research Fellow of Japan Science and Technology Agency (JST) SPRING Program Apr 2024 - Mar 2027

- Developed a set of diligence-related indicators for household travel surveys, including item nonrespondents, nonrespondents to open-ended questions, proxy respondents, incentive seekers, and late submitters.
- Examined the association between response diligence and possible trip misreporting comprehensively.
- Proposed a bias-correction framework integrating diligence indicators with behavioral models.

Determinants of license surrender behavior and its impact on mobility Kumamoto, Japan
Research Fellow of Japan Science and Technology Agency (JST) SPRING Program Ongoing

- Decomposed license surrender decisions into intention and actual behavior.
- Examined socio-demographic and built environment determinants of license surrender.
- Analyzing the impacts of license surrender on travel behavior (ongoing).

A time-varying network modeling framework for multimodal travel behavior analysis Kumamoto, Japan
Master Researcher Apr 2023 - Mar 2024

- Proposed a time-varying network approach to characterize mobility in metropolitan areas.
- Incorporated inter-layer temporal connections into the network representation.
- Developed an extended PageRank algorithm to evaluate regional importance in time-varying mobility networks.
- Proposed analytical framework corrected the underestimation of peripheral regions' importance.

Exploring the heterogeneity of travel behavior among elderly people in Kumamoto Kumamoto, Japan
Master Researcher Apr 2022 - Mar 2024

- Analyzed how self-rated health and car use status influence trip purpose and corresponding travel frequencies among older adults in the Kumamoto metropolitan area.
- Applied latent class analysis (LCA) to identify heterogeneity in elderly travel purposes.
- Identified five distinct latent classes: inactive seniors, seniors with essential living needs, senior commuters, seniors with high shopping needs, and active seniors based on trip purposes.
- Analyzed the effects of socio-demographic and transportation-related factors on latent classes membership.

PUBLICATIONS

Peer-Reviewed Papers

Published

- [1] **Zhiwei Zhang** & Takuya Maruyama, 2026. Is item nonresponse associated with trip underreporting in household travel surveys? Evidence from Kumamoto, Japan. *Travel Behaviour and Society*, 45, 101297. DOI: [10.1016/j.tbs.2026.101297](https://doi.org/10.1016/j.tbs.2026.101297)
- [2] **Zhiwei Zhang** & Takuya Maruyama, 2026. Immobility or soft refusal? An empirical analysis of the association between respondents' diligence and reported immobility in household travel surveys. *Transportation Research Part A: Policy and Practice*, 204, 104815. DOI: [10.1016/j.tra.2025.104815](https://doi.org/10.1016/j.tra.2025.104815)
- [3] Takuya Maruyama, Yuto Abe, Shunsuke Arao, & **Zhiwei Zhang**, 2026. Increased stay-at-home or increased soft refusal? A comparison of time-use and household travel surveys in Japan. *Transportation Research Procedia*, 97, 151-161. DOI: [10.1016/j.trpro.2026.04.152](https://doi.org/10.1016/j.trpro.2026.04.152)
- [4] **Zhiwei Zhang**, Hiroe Ando, Yige Wang, Tianlei Zhu, & Xin Yang, 2025. Analysis of mobility discrepancies within urban agglomerations using an extended PageRank algorithm in time-varying multimodal networks. *Physica A: Statistical Mechanics and its Applications*, 652, 131060. DOI: [10.1016/j.physa.2025.131060](https://doi.org/10.1016/j.physa.2025.131060)

In-submission (Reviewed)

- [5] Yige Wang, **Zhiwei Zhang** (Corresponding Author), Takuya Maruyama, & Chunhong Zhao. How do the ecological zones restrict and govern the expansion of functional layout? Evidence from Jinan, China.

Conference Proceedings

- [6] **Zhiwei Zhang** & Takuya Maruyama, 2024. Exploring the Heterogeneity of the Travel Behavior of the Elderly in the Kumamoto Metropolitan Area Based on Latent Class Analysis. In *CICTP 2024*, pp. 955-964. DOI: [10.1016/9780784485484.091](https://doi.org/10.1016/9780784485484.091)

CONFERENCE PRESENTATIONS

- [1] **Zhiwei Zhang**, Yuki Hamasaki, Yige Wang, & Takuya Maruyama, 2026.06. The travel behavior changes after surrendering the driver's license-Evidence from Kumamoto Presented at the 4 Universities Joint International Conference, The University of Calgary, Calgary, Canada.
- [2] Takuya Maruyama, Yuto Abe, Shunsuke Arao, & **Zhiwei Zhang**, 2025.04. Immobility or soft refusal? An empirical analysis of the association between respondents' diligence and reported immobility in household travel surveys. Presented at the 13th International Conference on Transport Survey Methods (ISCTSC2025), Da Nang, Vietnam.
- [3] **Zhiwei Zhang** & Takuya Maruyama, 2025.06. Association between Respondent Diligence and Soft Refusal in Household Travel Surveys: A Case Study in Kumamoto, Japan. Poster presented at the 71st Infrastructure Planning Conference (Spring), Kagawa University, Kagawa, Japan.
- [4] **Zhiwei Zhang** & Takuya Maruyama, 2025.07. Immobility or soft refusal? An empirical analysis of the association between respondents' diligence and reported immobility in household travel surveys. Presented at the 4 Universities Joint International Conference, Tongji University, Shanghai, China.
- [5] **Zhiwei Zhang** & Takuya Maruyama, 2025.08. Immobility or soft refusal? – Validating the impact of diligence on immobility reported in the household travel survey. Presented at the Bridging Transportation Researchers (BTR) Online Conference.
- [6] **Zhiwei Zhang** & Takuya Maruyama, 2025.09. Is item nonresponse associated with trip underreporting in household travel surveys? Evidence from Kumamoto, Japan. Presented at the Seminar on National Land, Transport and Society, Kobe University, Kobe, Japan.
- [7] **Zhiwei Zhang** & Takuya Maruyama, 2025.11. Is item nonresponse associated with trip underreporting in household travel surveys? Evidence from Kumamoto, Japan. Presented at the 72nd Infrastructure Planning Conference (Autumn), Fukui University of Technology, Fukui, Japan.
- [8] Liwen Chien, **Zhiwei Zhang**, & Takuya Maruyama, 2025.07. Exploring the Association Between the Built Environment and Elderly Driver's License Return: Evidence from Kumamoto, Japan. Presented at the 4 Universities Joint International Conference, Tongji University, Shanghai, China.
- [9] Liwen Chien, **Zhiwei Zhang**, & Takuya Maruyama, 2025.08. Exploring the Association Between the Built Environment and Elderly Driver's License Return: Evidence from Kumamoto, Japan. Presented at the Bridging Transportation Researchers (BTR) Online Conference.
- [10] **Zhiwei Zhang** & Takuya Maruyama, 2023.07. Exploring the Heterogeneity of the Travel Behavior of the Elderly in Kumamoto Metropolitan Area Based on Latent Class Analysis. Poster presented at the 23rd COTA International Conference of Transportation Professionals (CICTP 2023), Beijing, China.
- [11] **Zhiwei Zhang** & Takuya Maruyama, 2022.12. Exploring the Travel Characteristics of Elderly in Kumamoto Metropolitan Area. Presented at the 17th International Student Conference on Advanced Science and Technology (ICAST 2022), Kumamoto University, Japan.
- [12] **Zhiwei Zhang** & Takuya Maruyama, 2022.10. Research on the Adaptability of Urban Public Transport

[Systems for the Elderly](#). Poster presented at the *1st Kumadai-Hub Poster Session*, Kumamoto University, Japan.

SKILLS

- **Programming:** R, Python, MATLAB, $\text{\LaTeX}$
- **Mapping & Spatial Analysis:** QGIS, ArcGIS
- **Statistical Modeling & Machine Learning:**
 - Discrete Choice Models:** Probit models, Binary Logit, Multinomial Logit, Nested Logit, and Mixed Logit (Random Parameters Logit) Models, and Generalized Extreme Value (GEV) Models.
 - Count Models:** Poisson Regression, Negative Binomial Regression, Zero-Inflated Models, Hurdle Model.
 - Sample Selection Models:** Heckman Sample Selection Model, Probit with Sample Selection (PSS) Model
 - Latent Variable & Clustering Analysis:** Latent Class Analysis (LCA) and Latent Profile Analysis (LPA); K-means, DBSCAN, K-medoids, Fisher’s Optimal Partitioning (Ordered sample).
 - Machine Learning & Deep Learning Models:** Random Forest, XGBoost, SHAP Analysis, Support Vector Machines (SVM), K-Nearest Neighbors (KNN), and Decision Tree; Graph Convolutional Neural Networks (GCNN).
- **Complex Network Analysis:** Centrality Algorithms (Degree, Betweenness, Closeness, Eigenvector, and PageRank), Community Detection Algorithms (Louvain, Infomap, and Spectral Clustering), Percolation Theory and Cascade Failure.

AWARDS

Shimizu Ikueikai Foundation Scholarship Awardee	<i>Apr 2023 - Mar 2024</i> <i>Tokyo, Japan</i>
Outstanding Graduate of Fujian University of Technology University-level Honor (Top percentage of graduates)	<i>2021</i> <i>Fuzhou, China</i>
Fujian University of Technology Academic Scholarships First-class (1 time), Second-class (3 times), Third-class (2 times)	<i>2017 - 2021</i> <i>Fuzhou, China</i>

LANGUAGE SKILLS

ENGLISH

TOEFL-IBT: 87
Listening: 21 | Reading: 21
Speaking: 22 | Writing: 23
Test date: Jul, 2023

JAPANESE

Japanese-Language Proficiency Test: N1, 133
Language Knowledge (Vocabulary/Grammar): 45
Reading: 51 | Listening: 37
Test date: Jul, 2025