

Kunihiko Fujiwara

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Summary

Senior researcher specializing in urban environmental engineering with expertise in urban microclimate, thermal comfort, and 3D morphology analysis. Applies advanced methodologies combining physical simulations, field measurements, computer vision, machine learning, and geospatial data analysis to investigate the relationship between urban morphology and thermal environment. Research contributions span from fundamental academic investigations to the practical implementation of innovative technologies in urban planning and architectural design. Current focus includes developing digital twin solutions for climate adaptation, optimizing green infrastructure, and creating computational tools for thermal comfort assessment.

Research Interests

Urban Environment Simulation, Microclimate, Heat Mitigation, Green Infrastructure, Street View Imagery, 3D City Model

Education

DEng	Tokyo Institute of Technology , Urban Environment Engineering	Sept 2016 – Aug 2020
	<ul style="list-style-type: none">Thesis on optimization of tree arrangement for heat mitigation.Supervised by Prof. Takashi Asawa.	
MEng	Tokyo Institute of Technology , Urban Environment Engineering	Apr 2011 – Mar 2013
BEng	Tokyo Institute of Technology , Architecture	Apr 2007 – Mar 2011

Experience

Visiting Research Fellow		Singapore
<ul style="list-style-type: none">Urban Analytics Lab, National University of Singapore		Apr 2023 – Present
Senior Researcher		Japan
<ul style="list-style-type: none">Research & Development Institute, Takenaka CorporationConduct research on urban environmental engineering and develop innovative technologies for urban planning		Apr 2018 – Present
Researcher		Japan
<ul style="list-style-type: none">Research & Development Institute, Takenaka Corporation		Apr 2014 – Mar 2017
Building Equipment Engineer		Japan
<ul style="list-style-type: none">Building Design Department, Takenaka Corporation		Apr 2017 – Mar 2018, 2013 – Mar 2014

Awards

- **Special Encouragement Award** (2023), Engineering Advancement Association of Japan
- **Technology Award** (2023), Heat Island Institute International
- **Bronze Award** (2023), Urban Data Challenge
- **Best Poster Award** (2022), 17th Conference of Heat Island Institute International
- **Award of Excellence** (2021), Urban Infrastructure & Technology Promotion Council

Publications

VoxCity: A Seamless Framework for Open Geospatial Data Integration, Grid-Based Semantic 3D City Model Generation, and Urban Environment Simulation Kunihiko Fujiwara,	2025
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Ryuta Tsurumi, Tomoki Kiyono, Zicheng Fan, Xiucheng Liang, Binyu Lei, Winston Yap, Koichi Ito, Filip Biljecki arXiv preprint arXiv:2504.13934
DOI: [10.48550/arXiv.2504.13934](https://doi.org/10.48550/arXiv.2504.13934)

ZenSVI: An open-source software for the integrated acquisition, processing and analysis of street view imagery towards scalable urban science Koichi Ito, Yihan Zhu, Mahmoud Abdelrahman, Xiucheng Liang, Zicheng Fan, Yujun Hou, Tianhong Zhao, Rui Ma, **Kunihiko Fujiwara**, Jiani Ouyang, Matias Quintana, Filip Biljecki Computers, Environment and Urban Systems, 119
DOI: [10.1016/j.compenvurbsys.2025.102283](https://doi.org/10.1016/j.compenvurbsys.2025.102283)

A panorama-based technique to estimate sky view factor and solar irradiance considering transmittance of tree canopies Kunihiko Fujiwara, Koichi Ito, Marcel Ignatius, Filip Biljecki Building and Environment, 266
DOI: [10.1016/j.buildenv.2024.112071](https://doi.org/10.1016/j.buildenv.2024.112071)

Microclimate Vision: Multimodal prediction of climatic parameters using street-level and satellite imagery Kunihiko Fujiwara, Maxim Khomiakov, Winston Yap, Marcel Ignatius, Filip Biljecki Sustainable Cities and Society, 114
DOI: [10.1016/j.scs.2024.105733](https://doi.org/10.1016/j.scs.2024.105733)

Digital Twin and Wearables Unveiling Pedestrian Comfort Dynamics and Walkability in Cities Marcel Ignatius, Joie Lim, Ben Gottkehas Kamp, **Kunihiko Fujiwara**, Clayton Miller, Filip Biljecki ISPRS Annals of Photogrammetry, Remote Sensing & Spatial Information Sciences, 10
DOI: [10.5194/isprs-annals-X-4-W5-2024-195-2024](https://doi.org/10.5194/isprs-annals-X-4-W5-2024-195-2024)

Effects of solar radiation in the streets on pedestrian route choice in a city during the summer season Yasuhiko Azegami, Mineko Imanishi, **Kunihiko Fujiwara**, Hiroyuki Kusaka Building and Environment, 235, 110250
DOI: [10.1016/j.buildenv.2023.110250](https://doi.org/10.1016/j.buildenv.2023.110250)

Review of future weather data for building simulations available in Japan and confirmation of its characteristics Yusuke Arima, **Kunihiko Fujiwara**, Yasuhiko Azegami, Hajime Iseda, Akihito Ozaki, Younhee Choi E3S Web of Conferences, 396, 05014
DOI: [10.1051/e3sconf/202339605014](https://doi.org/10.1051/e3sconf/202339605014)

Optimization and evaluation of tree arrangement in open space for urban heat adaptation and heat island mitigation Kunihiko Fujiwara, Takashi Asawa, Tomoki Kiyono Journal of Environmental Engineering (Transactions of AIJ), 85(772), 475-484
DOI: [10.3130/aije.85.475](https://doi.org/10.3130/aije.85.475)

Patents

- **Ground Heat Utilization Cooling Structure** (Pending)
- **Water Level Estimation Device and Water Level Estimation Program** (Pending)
- **Information Processing Device and Information Processing Program** (Pending)
- **Circulation Evaluation Support Device, Circulation Evaluation Support System, and Program** (Pending)
- **Circulation Degree Estimation Device, Circulation Degree Estimation System, and Program** (Pending)
- **Micro-weather Element Estimation Device and Micro-weather Element Estimation Program** (Pending)
- **Landscape Analysis Support Device and Landscape Analysis Support Program** (Active)
- **Motif Similarity Calculation Device and Model Learning Device** (Active)

- **Weather Prediction Device and Weather Prediction Model Learning Device** (Active)
- **Growth Evaluation Control Device, Growth Evaluation Method, Growth Evaluation Control Program** (Active)
- **Space Evaluation Support Device, Space Evaluation Support System, and Space Evaluation Support Program** (Active)
- **Space Evaluation Support Device, Space Evaluation Support System, and Space Evaluation Support Program** (Pending)
- **Space Evaluation Support Device, Space Evaluation Support System, and Space Evaluation Support Program** (Active)
- **Building Design Support Device and Building Design Support Program** (Active)
- **Recommendation Degree Derivation Device, Energy-saving Promotion Device and Program** (Active)

Peer Reviews

- **Frontiers of Architectural Research** (3 reviews)
- **International Journal of Applied Earth Observation and Geoinformation** (1 review)
- **Sustainable Cities and Society** (1 review)
- **Urban Climate** (2 reviews)
- **Scientific Report** (1 review)
- **Cities** (2 reviews)

Skills

Technical: Python, Data Science, Computational Simulation

Languages: Japanese (Native), English (Proficient)

Invited Talks

- Keynote speaker, Urban-M4 Symposium, Feb. 24, 2025
- Guest speaker, Prime Seminar, Heat Island Institute International, Mar. 22, 2024
- Guest speaker, Discussion seminar, Climate Change AI, Oct. 11, 2024
- Guest speaker, Social Design FS Seminar, Yokohama National University, Oct. 18, 2024