

TIAN LI

Ph.D., Douglass Assistant Professor, Assoc. AIA, LEED AP
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EDUCATION

- Aug 2021-May 2024 **Carnegie Mellon University**, Pittsburgh, PA
Ph.D. in Building Performance and Diagnostics, Cumulative GPA: 3.89/4.0.
Awards/Funding: Funded by U.S. General Services Administration (GSA) Research Grant, ARCC King Medal Award, Carnegie Mellon University Assembly/Provost GuSH Grant.
Thesis: AI-driven building energy and carbon emissions benchmarking at multiple scales.
- Aug 2020-May 2021 **Illinois Institute of Technology**, Chicago, IL
Ph.D. in Architecture, Technology of Built Environment Track, Cumulative GPA: 3.50/4.0.
Awards/Funding: Vinci Fellowship Grant Funding.
- Aug 2017-May 2020 **Washington University**, St. Louis, MO
Master of Architecture, Cumulative GPA: 3.56/4.0.
Awards/Funding: Graduate School Scholarship \$36,000.
Thesis: Abandoned buildings rethinking: community healthcare center design in St. Louis.
- Sep 2014-Jun 2017 **Tianjin University**, Tianjin, China (National 985/211 Key University)
Master of Architecture, Cumulative GPA (Equiv.): 3.50/4.0.
Awards/Funding: Funded by the Foundation of Tianjin Science and Technology Commission, Funding N.O. 16YFZCSF00520.
Thesis: Research on design strategy optimization of green buildings based on operation.
- Sep 2009-Jun 2014 **North China University of Science and Technology**, Tangshan, China
Bachelor of Engineering, Cumulative GPA (Equiv.): 3.67/4.0.
Awards/Funding: Dean's List of Honors, First Category Scholarship.
Thesis: Improvement of residential space by design strategy.

ACADEMIC APPOINTMENTS

- Aug 2024-present **Douglass Assistant Professor - Building Technology, University of Nebraska**, Lincoln, NE
- ARCH 5/611 Advanced Architectural Design Studio: Graduate integrated research studio.
 - ARCH 311 Architectural Design Studio - Situate: Creating effective and appropriate relationships with manmade/natural environments.
 - ARCH 430 Technological Integration: For building structural, technology, and environmental systems.
 - Research Project: AI-driven building performance and carbon emissions analysis.
- Aug 2023-May 2024 **Instructor - Building Science, Carnegie Mellon University**, Pittsburgh, PA
- ARCH 48-733: Environmental Performance Simulation: to analyze building renewable energy, visible & thermal comfort, sustainability, and optimization via advanced simulation tools, i.e., Grasshopper-based programs, EnergyPlus, ClimateStudio, etc.
 - Thesis Advisor: Guided M.S. in Building Performance Diagnostics thesis projects.

- Aug 2022-May 2024 **Adjunct Professor - Architecture Studio, University of Pittsburgh, Pittsburgh, PA**
- ARCH 1203 Sustainable Studio: Sustainability of urban residential housing design.
 - ARCH 1204 Advanced Studio: Comprehensive design integrated with CD drawings.
 - ARCH 48215 Materials and Assembly: Building systems and construction foundations.
 - Produced and developed a core course: Environmental Building System 01.

PROFESSIONAL EXPERIENCES

- Aug 2021-present **Ph.D. Researcher/RA, Carnegie Mellon University, Pittsburgh, PA**
- Investigated the U.S. General Services Administration (GSA) Total Estimated Cost Impact (TECI) Metrics Evaluation project for energy, carbon emissions, fault detection, and cost analysis, PI: Vivian Loftness.
 - Worked on the GSA National Outdoor Air Verification (NOVA) project for ventilation, energy, wellness, and indoor air quality, PI: Vivian Loftness.
 - Analyzed the University of Pittsburgh Medical Center (UPMC) funded project with building performance, façade options for patient visual/thermal comfort, and indoor environmental quality, PI: Azadeh O. Sawyer & Alstan Jakubiec.
 - Participated in 50 bird-friendly glass patterns for sustainable buildings with visual comfort analysis, funded by American Bird Conservancy (ABC) and Carnegie Mellon University College of Fine Arts' Fund for Research and Creativity, PI: Azadeh O. Sawyer.
- May 2022-Aug 2022 **Building Performance Intern, Affiliated Engineers, Inc., Madison, WI**
- Developed building performance modeling for Cole Eye Clinic Center, Cleveland, OH.
 - Evaluated the performance and created the energy modeling for Millipore Sigma K3 Lab, Sheboygan Falls, WI.
 - Developed and improved the Energy Plus interface with data pre-processing using Python.
- Jun 2021-Aug 2021 **Architectural Intern, Skidmore, Owings & Merrill (SOM)**
 Jun 2018-Aug 2018 Chicago, IL (2021) & Washington, DC (2018)
- Participated in the technical and interior design of Saudi Arabian Monetary Authority (SAMA), Riyadh, Saudi Arabia (construction documentation phase).
 - Joined in Zhengzhou Yongwei Longhu Parcel 117 Development project for planning and architectural design (conceptual design phase).
 - Led ceiling system renovation and daylighting strategy analysis.
- July 2020-Aug 2021 (Part-time) **VP of Sustainability, Merakis Group, Ziran Education Foundation, Essex, England, UK**
- Led sustainable research and analysis for Educational Land Use Planning and Development Project: K-12 & Academy of Continuing Education with the government.
 - Designed and planned for the Merakis Coffee House and Exchange Trading Store.
 - Directed the product design for creating a playground that empowers emerging creatives and visionary investors to bring the next big ideas to life.
- Feb 2019-Jul 2019 **Architectural Intern, Henning Larsen Architects, Copenhagen, Denmark**
- Participated in the schematic design (SD) and design development (DD) phase of Jubail Convention Center, Jubail, Saudi Arabia.
 - Researched users' behavior and interior comfort in indoor environments.
 - Analyzed building environmental systems to achieve the project's LEED Gold goal.

- Aug 2018-Jan 2019 **Architectural Intern, NORD Architects**, Copenhagen, Denmark
- Joined in the construction documentation (CD) phase and conducted the assembly of materials for Lyngdal Nursing Home in Norway.
 - Communicated and investigated site topography, geographic, and other contexts.
 - Analyzed interior color with thermal and lighting comfort for the nursing homes.
- Aug 2017-May 2019 **Research Assistant, Washington University**, St. Louis, MO
- Involved in technical research, building performance calculation, and construction on site for CRETE House, U.S. Department of Energy Solar Decathlon competition, Denver, CO.
 - Designed the building systems and programming for Lotus House, a 3D printed house, U.S. Department of Energy Solar Decathlon competition, Dezhou, China.
- Dec 2017-Jan 2018 **Architectural Intern, MGA Partners**, Philadelphia, PA
- Joined the Lancaster County Day School in the conceptual design phase, Lancaster, PA.
 - Analyzed the site and landscape to improve the outdoor space quality and accessibility.
 - Prepared presentation slides and firm design portfolio.
- Feb 2016-Jun 2017 **Research Assistant, Tianjin University**, Tianjin, China
- Investigated daylighting control and building enclosure related to architectural design.
 - Researched the individual study of operation and energy consumption simulation model of an existing sustainable building in Sino-Singapore Tianjin Eco-City, Tianjin, China.
- Dec 2013-present
(Part-time) **Co-Founder, Leadership, 1895 Design Institute LLC**, Tianjin, China
- Created a platform for 30,000+ undergraduate/graduate students nationwide in China to communicate and share architectural design and technology resources.
 - Led four design courses (Fast architectural design, Hand sketch, 3D model-based software, Graduate school application consult) for 500+ undergraduate students.
 - Organized public lecture series for higher education institutes regarding design philosophy, building science, and technology.

PUBLICATIONS & RESEARCH PROJECTS

- 2024 - Ph.D. Thesis **Li, T.** (2024). AI-driven building energy and carbon emissions benchmarking at multiple scales. Carnegie Mellon University, Pittsburgh, PA.
- 2024 - Journal **Li, T.,** Liu, T., Sawyer, A.O., Tang, P., Loftness, V., Lu, Y., Xie, J. (2024). Generalized building energy and carbon emissions benchmarking with post-prediction analysis. *Developments in the Built Environment*. DOI: <https://doi.org/10.1016/j.dibe.2024.100320>.
- 2024 - Journal **Li, T.,** Bie, H., Lu, Y., Sawyer, A.O., Loftness, V. (2024). MEBA: AI-powered precise building monthly energy benchmarking approach. *Applied Energy*. Special Issue: AI in Energy and Carbon Emission. DOI: <https://doi.org/10.1016/j.apenergy.2024.122716>
- 2024 - Journal Tian, J., Zhao, T., Li, Z., **Li, T.,** Bie, H., Loftness, V. (2024). VOD: Vision-Based Building Energy Data Outlier Detection. *Machine Learning and Knowledge Extraction*, 6(2), 965-986. DOI: <https://doi.org/10.3390/make6020045>.
- 2024 - Journal Guo, B., **Li, T.,** Yu, H., Loftness, V. (Under-review). Data-driven approaches to improving EUI prediction accuracy for benchmarking. *Energy and Buildings*.

- 2023 - Conference **Li, T.,** Xie, J., Liu, T., Lu, Y., Sawyer, A.O. (2023). An Innovative Building Energy Use Analysis by Unsupervised Classification and Supervised Learning Models. *ASHRAE Annual Conference, Tampa, FL*. <https://www.researchgate.net/publication/372338645>.
- 2023 - Journal **Li, T.,** Xie, J., Liu, T., Lu, Y., Sawyer, A.O., Loftness, V., Tang, P. (Under-review). DUAL-FEED: AI-driven building end-use energy benchmarking classification and forecasting. *Developments in the Built Environment*.
- 2022 - Journal Xie, J., Sawyer, A.O., Ge, S., **Li, T.** (2022). Subjective Impression of an Office with Biophilic Design and Blue Lighting: A Pilot Study. *Buildings*, 13(1), 42. DOI: <https://doi.org/10.3390/buildings13010042>.
- 2022-2023 Project Report Loftness, V., Bie, H., **Li, T.,** Tian, J., Liang, W. (2023). *Evaluation of General Service Administration (GSA) Total Estimated Cost Impacts (TECI) of BAS System Sparks with Advanced Meter Data Analytics*, Center for Building Performance & Diagnostics (CBPD), Carnegie Mellon University.
- 2022-2023 Project Report Loftness, V., Bie, H., **Li, T.,** Tian, J., Liang, W. (2023). *Summary of General Service Administration (GSA) National Outdoor Air Verification (NOVA) Field Studies*, Center for Building Performance & Diagnostics (CBPD), Carnegie Mellon University.
- 2022-2023 Project Report **Carnegie Mellon University,** University of Toronto, HGA Architects. (2023). *University of Pittsburgh Medical Center (UPMC) Heart and Transplant Hospital Daylighting and Thermal Comfort Analysis*, PI: Azadeh Omidfar Sawyer & Alstan Jakubiec.
- 2022 - Book **1895 Design Institute.** (2022). *Guide of Quick Landscape Architecture Design*, China Machine Press, ISBN: 9787111722564, 1st edition, Beijing, China (1000+ Purchase).
- 2021 - Journal **Li, T.,** Lu, Y. (2021). A Review of Hybrid Mode of Inpatient Care and Homecare Design Based on IoMT Technology. *Prometheus*, 5. Available at: <https://prometheus.library.iit.edu/index.php/journal/article/view/15>.
- 2021 - Journal **Li, T.,** Lu, Y., Jiang, F., Sawyer, A.O. (In process). Net Zero Energy Retrofit Feasibility and Cost Analysis for A Historical Education Building in Cold Climate Zone, *Applied Energy*.
- 2020 - Master Thesis **Li, T.** (2020). Abandoned Building Rethinking: Community Healthcare Center Research, *The Gallery of the Creative Exchange Lab*, Washington University, St. Louis, MO.
- 2018 - Book **1895 Design Institute.** (2018). *Guide of Quick Architecture Design*, China Machine Press, ISBN: 7111585097, 1st edition, Beijing, China (8,000+ Purchase).
- 2018 - Conference Wang, C., Zhang, M., **Li, T.,** Juan, Y., Wang, Y. (2018). Investigation of Physical Environment of Atriums in Large Buildings in Beijing, Tianjin, and Hebei Province, *CIE Topical Conference*, Taipei, Taiwan.
- 2018 - Conference Wang, C., Zhang, M., **Li, T.,** Yu., J., Wang, Y. (2018). Optimization of Atrium Spatial Light Environment Comfort based on Subjective Evaluation, *The 10th Asia Lighting Conference*, Kobe, Japan.
- 2017 - Conference Wang, C., Zhen, Y., Zhang, M., **Li, T.** (2017). Investigation on Reflecting Light from Glass Curtain Wall Building in Tianjin Area, *The 10th Asia Lighting Conference*, Shanghai, China.
- 2016 - Master Thesis **Li, T.** (2016). Research on Design Strategy Optimization of Green Buildings Based on Operation Effect: Take LCLL Building as An Example (Funded by Tianjin Science and Technology Programs: 16YFZCSF00520, Available at CNKI), Tianjin University, Tianjin, China.

SPEECHES & LECTURES

May 2024	Graduation Commencement Speaker: The School of Architecture at Carnegie Mellon University, on behalf of entire graduate students.
May 2024	AIA Panelist: AIA Build Pittsburgh of Exploring the Future of Architectural Practice: Navigating AI and Emerging Technologies, on behalf of Carnegie Mellon University.
Jul 2023	ASHRAE Annual Conference Speaker: Speech for the paper session on AI and Machine Learning / Energy Models - Buildings, Tampa, FL.
May 2023	Green Building Alliance (GBA): Speech regarding building decarbonization and electrification study by advanced AI models.
Nov 2022	Architecture Lecture: Active and passive sustainable design strategies overview lecture at the University of Pittsburgh.
Nov 2021	5th Ph.D. International Annual Research Symposium: Speech of Human Behavior, Performance, and Built Environments at Illinois Institute of Technology, Chicago, IL.
Apr 2021	US Department of Energy (DOE): Solar Decathlon Competition interview on behalf of the Illinois Institute of Technology to participate in the project competition.
2014-2018	Public Lecture Exchanges: Speeches for senior undergraduate students at 50+ Higher Education institutes , including the top 985/211 National Key Universities in China, such as Tianjin University, Beijing University of Technology, Nanjing University, South China University of Technology, Wuhan University, Huazhong University of Science and Technology, etc., regarding architectural design philosophy, study experience, and building up the architectural connection platform.
Nov 2017	10th Asia Lighting Conference Speaker: Speech for the conference paper session on indoor environmental quality and visual comfort, Shanghai, China.

EDITORIAL SERVICE & REVIEWS

May 2024	Leading Guest Editor: Special Issue of Carbon Emissions Analysis by AI Techniques, Journal of <i>Information</i> , Publisher: MDPI. https://www.mdpi.com/journal/information/special_issues/TT9R353B0G .
May 2024	MEIE Paper Reviewer: The 7 th International Conference on Mechanical, Electric, and Industrial Engineering (MEIE 2024), Yichang, China. https://www.icmeie.com .
Jun 2023	ASHRAE Technical Paper Reviewer: Reviewed annual ASHRAE technical conference paper, Tampa, FL. https://www.ashrae.org/conferences/2023-annual-conference-tampa .
Apr 2023	Architecture Studio Reviewer: Invited as the guest reviewer for the final review of Architecture Design Studio ARCH-1202 at the University of Pittsburgh.
Dec 2022	Architecture Studio Reviewer: Invited as the guest reviewer for the midterm & final reviews of Architecture Design Studio ARCH-1201 at the University of Pittsburgh.

GRANTS & FUNDINGS

May 2024	The 2024 Seed Grant Program: The Wilton E. Scott Institute for Energy Innovation \$60,000 (Role: PI, Co-PI: Azadeh O. Sawyer).
Jun 2023	Carnegie Mellon University Conference Funding, Grant support for conference and traveling from Carnegie Mellon University \$1,500, Pittsburgh, PA (Role: PI).
Apr 2022	Carnegie Mellon University Assembly/Provost GuSH Grant, Grant support for doctoral studies from Carnegie Mellon University \$3,000, Pittsburgh, PA (Role: PI).
Nov 2022	

AWARDS & QUALIFICATIONS & MEMBERSHIPS

June 2024	Douglass Architecture Professorship , College of Architecture, University of Nebraska, Lincoln, NE.
May 2024	ARCC King Medal Award , ARCC King Student Medal for Excellence in Architectural and Environmental Design Research, Pittsburgh, PA.
Nov 2022-present	ASHRAE Member , The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Atlanta, GA.
Sep 2021	U.S. Department of Energy Solar Decathlon Building Competition , First Prize for Net Zero Retail Design, on behalf of Illinois Institute of Technology, Chicago, IL, https://www.solardecathlon.gov/2021/design/challenges-results.html .
Sep 2020-present	Patent of Gesture Recognition based on EMG (Electromyography) for Healthcare Facilities , FlectThink Group, Hangzhou, China (In Process), https://www.flexolinkai.com .
May 2021	Top 3 Designs in Wharton Tangen Hall Furniture Competition , Wharton School of Business, University of Pennsylvania, Philadelphia, PA (built), https://www.imtianli.com/lets-go-surfing .
May 2020-present	Associate AIA , American Institute of Architects (AIA), Washington, DC.
Jun 2019-present	LEED AP BD+C , U.S. Green Building Council, (USGBC) Washington, DC.
Aug 2018	SOM Fellowship Program , Skidmore, Owings & Merrill, LLP, Washington, DC.
Nov 2017	U.S. Department of Energy Solar Decathlon Building Competition , Second Design Prize, on behalf of Washington University, Denver, CO (Built), https://www.solardecathlon.gov/2017/where-is-wash-u-now.html .
Nov 2015	Tianjin University New Campus Gateway Design Build , Tianjin, China (Built), https://www.imtianli.com/the-gate .
Aug 2015	31st Busan International Architecture Competition , Honorable Award, Busan, Korea.
Sep 2014	Tianjin International Design Studio Exchange Program , First Prize, Tianjin, China.

SKILLS

Language	Fluent in Mandarin Chinese.
Programming	Python, Java, R, JavaScript, C++.
Data Analysis	Power BI, Tableau, ArcGIS.
Architecture	Revit (BIM), AutoCAD, Rhino 3D, Grasshopper, Sketch Up, Adobe Suite, Hand Sketches.
Simulation	Open Studio, Energy Plus, Climate Studio, IES VE, UMI, Grasshopper-based simulation tools (Ladybug, Honeybee, Pollination, etc.).
Text Editing	Latex Editor, Jupyter, Sublime, Visual Studio, Microsoft Office Suite.
Teaching Platform	Canvas, Blackboard, Miro board, Jamboard, etc.

INTERESTS

Aug 2014 (first time)	Swim across the longest river (Yangtze River) in China.
May 2017, Dec 2021	Drive all the way from the East Coast to the West Coast.
Always	Cook the finest fish for family and friends.
Always	Discuss the state-of-the-art AI techniques related to building design and technology.
Sometimes	Write funny video games for friends' birthday gifts via Python.