

# TIAN LI

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## EDUCATION

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- 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  
**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:** Outstanding Graduate Award, First Category Scholarship.  
**Thesis:** Improvement of residential space by design strategy.

## ACADEMIC APPOINTMENTS

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- Aug 2024-present **Douglass Assistant Professor - Building Technology, University of Nebraska**, Lincoln, NE
- ARCH 5/610 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: 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 for Master Student in Building Performance Diagnostics 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.
  - Developed a core course: Environmental Building System 01.

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### PROFESSIONAL EXPERIENCES

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- Aug 2021-May 2024 **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 (IAQ), 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 (IEQ), 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 refined 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 the 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 building system design 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) phases of Jubail Convention Center, Jubail, Saudi Arabia.
  - Investigated users' behavior and interior comfort in indoor environments.
  - Analyzed environmental systems to support the project's LEED Gold application.

- Aug 2018-Jan 2019     **Architectural Intern, NORD Architects**, Copenhagen, Denmark
- Joined in the construction documentation (CD) phase and conducted the assembly of material study for Lyngdal Nursing Home in Norway.
  - Communicated and investigated site topography, geographic analysis, surrounding buildings, and other site contexts.
  - Analyzed interior color with thermal and lighting comfort for nursing homes.
- Aug 2017-May 2019     **Research Assistant, Washington University**, St. Louis, MO
- Involved in technical research, building performance study, 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.
- Feb 2016-Jun 2017     **Research Assistant, Tianjin University**, Tianjin, China
- Investigated daylighting comfort and building enclosure related to architectural passive design strategies.
  - 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-Aug 2021     **Co-Founder, 1895 Design Institute LLC**, Tianjin, China
- Created a platform for 30,000+ undergraduate/graduate students nationwide in China to communicate and share architectural design resources.
  - Led four design courses (Fast architectural design, Hand sketch, 3D model-based software, Graduate school application consult).
  - Organized public lecture series regarding design philosophy, building science and technology theories.

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### PUBLICATIONS & RESEARCH PROJECTS

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- 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: Emerging AI Technologies in Energy Consumption and Carbon Emission Modelling, Evaluation and Forecasting. 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). AI-driven multi-algorithm optimization for enhanced building energy benchmarking. *Advances in Applied Energy*.
- 2024 - Journal         Bie, H., Guo, B., **Li, T., Loftness, V.** (Under-review). A review of economizers in human-centered commercial buildings: control logic, energy saving, IAQ potential, fault, and performance enhancement. *Building and Environment*.

- 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.
- 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.
- 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.
- 2017 - Master Thesis **Li, T.** (2017). 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.

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## SPEECHES & LECTURES

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May 2024	<b>Graduation Commencement Speaker:</b> The School of Architecture at Carnegie Mellon University, on behalf of entire graduate students.
May 2024	<b>AIA Panelist:</b> AIA Build Pittsburgh of Exploring the Future of Architectural Practice: Navigating AI and Emerging Technologies, on behalf of Carnegie Mellon University.
Jul 2023	<b>ASHRAE Annual Conference Speaker:</b> Speech for the paper session on AI and Machine Learning / Energy Models - Buildings, Tampa, FL.
May 2023	<b>Green Building Alliance (GBA):</b> Speech regarding building decarbonization and electrification study by advanced AI models.
Nov 2022	<b>Architecture Studio Lecture:</b> Active and passive sustainable design strategies overview lecture at the University of Pittsburgh.
Nov 2021	<b>5<sup>th</sup> Ph.D. International Annual Research Symposium:</b> Speech of Human Behavior, Performance, and Built Environments at Illinois Institute of Technology, Chicago, IL.
Apr 2021	<b>US Department of Energy (DOE):</b> Solar Decathlon Competition interview on behalf of the Illinois Institute of Technology to participate in the project competition.
2014-2017	<b>Public Lectures:</b> Speeches for undergraduate students at higher education institutes regarding architectural design philosophy and practice experience.
Nov 2017	<b>10<sup>th</sup> Asia Lighting Conference Speaker:</b> Speech for the conference paper session on indoor environmental quality and visual comfort, Shanghai, China.

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## SERVICE & REVIEWS

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Aug 2024-present	<b>Faculty Affairs Committee:</b> College of Architecture at the University of Nebraska-Lincoln.
Aug 2024/Sep 2024	<b>Elsevier Reviewer:</b> Journal of <i>Development in The Built Environment</i> .
Jul 2024/Sep 2024	<b>Springer Reviewer:</b> Journal of <i>Environment, Development and Sustainability</i> .
Jun 2024-present	<b>Leading Guest Editor:</b> Special Issue of Carbon Emissions Analysis by AI Techniques, Journal of <i>Information</i> , Publisher: MDPI. <a href="https://www.mdpi.com/journal/information/special_issues/TT9R353B0G">https://www.mdpi.com/journal/information/special_issues/TT9R353B0G</a> .
May 2024	<b>MEIE Paper Reviewer:</b> The 7 <sup>th</sup> International Conference on Mechanical, Electric, and Industrial Engineering (MEIE 2024), Yichang, China. <a href="https://www.icmeie.com">https://www.icmeie.com</a> .
Jun 2023	<b>ASHRAE Technical Paper Reviewer:</b> Reviewed annual ASHRAE technical conference paper, Tampa, FL. <a href="https://www.ashrae.org/conferences/2023-annual-conference-tampa">https://www.ashrae.org/conferences/2023-annual-conference-tampa</a> .
Apr 2023	<b>Architecture Studio Reviewer:</b> Invited as the guest reviewer for the final review of Architecture Design Studio ARCH-1202 at the University of Pittsburgh.
Dec 2022	<b>Architecture Studio Reviewer:</b> Invited as the guest reviewer for the midterm & final reviews of Architecture Design Studio ARCH-1201 at the University of Pittsburgh.

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## GRANTS & FUNDING (INTERNAL)

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

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## AWARDS & QUALIFICATIONS & MEMBERSHIPS

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June 2024	<b>Douglass Architecture Professorship</b> , College of Architecture, University of Nebraska, Lincoln, NE.
May 2024	<b>ARCC King Medal Award</b> , ARCC King Student Medal for Excellence in Architectural and Environmental Design Research, Pittsburgh, PA.
Nov 2022-present	<b>ASHRAE Member</b> , The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Atlanta, GA.
Sep 2021	<b>U.S. Department of Energy Solar Decathlon Building Competition</b> , First Prize for Net Zero Retail Design, on behalf of Illinois Institute of Technology, Chicago, IL, <a href="https://www.solardecathlon.gov/2021/design/challenges-results.html">https://www.solardecathlon.gov/2021/design/challenges-results.html</a> .
May 2021	<b>Top 3 Designs in Wharton Tangen Hall Furniture Competition</b> , Wharton School of Business, University of Pennsylvania, Philadelphia, PA (built), <a href="https://www.imtianli.com/lets-go-surfing">https://www.imtianli.com/lets-go-surfing</a> .
May 2020-present	<b>Associate AIA</b> , American Institute of Architects (AIA), Washington, DC.
Jun 2019-present	<b>LEED Accredited Professional</b> , Credential ID: 11255423-AP-BD+C, U.S. Green Building Council, (USGBC) Washington, DC.
Aug 2018	<b>SOM Fellowship Program</b> , Skidmore, Owings & Merrill, LLP, Washington, DC.
Nov 2017	<b>U.S. Department of Energy Solar Decathlon Building Competition</b> , Second Design Prize, on behalf of Washington University, Denver, CO (Built), <a href="https://www.solardecathlon.gov/2017/where-is-wash-u-now.html">https://www.solardecathlon.gov/2017/where-is-wash-u-now.html</a> .
Nov 2015	<b>Tianjin University New Campus Gateway Design Build</b> , Tianjin, China (Built), <a href="https://www.imtianli.com/the-gate">https://www.imtianli.com/the-gate</a> .
Aug 2015	<b>31st Busan International Architecture Competition</b> , Honorable Award, Busan, Korea.
Sep 2014	<b>International Architectural Design Week</b> , First Prize, Tianjin, China.

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## SKILLS

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

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## INTERESTS

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Aug 2014 (first time)	<b>Swim</b> across the longest river (Yangtze River) in China.
May 2018, Dec 2021	<b>Drive</b> all the way from the East Coast to the West Coast.
Always	<b>Cook</b> the finest fish for family and friends.
Always	<b>Discuss</b> the state-of-the-art AI techniques related to building design and technology.
Sometimes	<b>Code</b> fun video games for friends' birthday gifts via Python.