

Yuan Lai

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EDUCATION

- 2019 **Ph.D.** New York University, Civil Engineering (Urban Systems and Informatics)
Minors: Data Science + Construction Management + Interactive Telecommunication
Dissertation: *Integrated Urban Informatics-Multidimensional Data Intelligence at High Resolution*
Advisor: Constantine E. Kontokosta
- 2016 **M.S.** New York University, Applied Urban Science and Informatics
- 2011 **M.S.** University at Buffalo, SUNY, Urban Planning (GIS/Spatial Analytics + Urban Design)
- 2009 **B.S.** Beijing Forestry University, Landscape Architecture, a minor in Law

HONORS & FELLOWSHIPS

- 2019 Google's AI Impact Challenge (NYU Marron Institute's Civic Analytics team)
- 2018 Real Estate Research Institute and Lawrence Berkeley National Laboratory Research Grant
- 2017 Best Project Award, United Nations Data for Climate Action Challenge
- 2017 Forefront Fellow, Urban Design Forum
- 2017 Data Science Fellow, Bloomberg Data for Good Exchange
- 2017 Bloomberg Augmented Reality Prototyping Fellow, Bloomberg & NYC Media Lab
- 2016 Winning Team Lead, NYU Campus Coding Collaborative Program
- 2016 Winning Team Lead in HackNYU, NYU
- 2015 1st Place in CUSP HackDay, NYU
- 2015 Academic Scholarship, Center for Urban Science and Progress, NYU
- 2014 2nd Place in Critical Datathon, Massachusetts Institute of Technology
- 2011 Best Urban Planning Master Thesis Award, University at Buffalo, SUNY
- 2011 Outstanding Student Project Award, American Planning Association
- 2011 Best Project Award, American Planning Association Western New York Chapter
- 2011 Academic Merit Scholarship, University at Buffalo, SUNY
- 2011 In-State Tuition Fellowship, University at Buffalo, SUNY
- 2010 In-State Tuition Fellowship, University at Buffalo, SUNY
- 2007 Best Debater, Beijing Forestry University
- 2007 Academic Merit Scholarship, Beijing Forestry University
- 2007 Outstanding Student Leader, Beijing Forestry University

TEACHING & MENTORING

- 2019 - present Lecturer in Urban Science and Planning
Department of Urban Studies & Planning, Massachusetts Institute of Technology

- 2019 Feb **Harvard-MIT Health Sciences and Technology (HST)**
Guest Lecture "Urban Informatics and Big Data for Quality-of-Life" for a graduate course HST.936: Leveraging Data Science in Global Health.
- 2018 Oct **MIT + Taipei Medical University Health IoT Hackathon**
Data science mentor and competition judge for a four-day hackathon in Taipei.
- 2018 Oct **Taipei Medical University School of Management, Data Science Institute**
Guest Lecture "Urban Informatics and Applied Data Science for Cities".
- 2018 Spring **New York University, Center for Urban Science and Progress (CUSP)**
Mentor for a Master's program capstone project "Pulse of the City: Understanding Population Dynamics for Lower Manhattan", guided graduate students for research design, data mining, and machine learning using large-scale WiFi probe request data to better understand population dynamics and the use of public space.
- 2017 Fall **New York University, Center for Urban Science and Progress (CUSP)**
Teaching assistant for Prof. Constantine E. Kontokosta in a graduate course "Urban Informatics and Civic Analytics", in charge of teaching lab sessions using Python and guiding term projects in urban computing and applied analytics.
- 2017 Feb **Columbia University, Graduate School of Architecture, Planning & Preservation**
Guest Lecture "Advanced Data Analytics for Urban Planning and Design" for a graduate urban design course "Algorithms and Urbanism".
- 2011 Fall **University at Buffalo, School of Architecture and Planning**
Teaching assistant for Prof. Jiyoung Park in a graduate course "Research Methods for Urban Planning", leading data analysis lab and quantitative research methods.

RESEARCH EXPERIENCE

- 2019- **Research Affiliate, NYU Marron Institute of Urban Management**
Performed applied analytics using Natural Language Processing for data mining and knowledge discovery in construction activity and development patterns. Research is supported by Real Estate Research Institute and Lawrence Berkeley National Laboratory.
- 2015- **Research Assistant, NYU Urban Intelligence Lab**
Performed data science research in mobility patterns, development change, building energy economics, and economic impact of urban infrastructure. Highlights include:
 - Social media analytics in neighborhood popularity and real estate price change;
 - Data mining and modeling for building energy and pricing dynamics;
 - Data mining and integrated modeling for urban-scale carbon emission estimation;
 - Data analytics for estimating the real estate impact of subway expansion (collaboration with NYU Stern Business School Center for Real Estate Finance Research).
- 2010-11 **Graduate Research Assistant, Department of Architecture, SUNY Buffalo**
Developed a spatial analytics method and master plan for brownfield redevelopment.
- 2010-11 **Graduate Researcher, Urban Design Project, SUNY Buffalo**
Performed zoning research and facilitated community participatory planning.
- 2009-10 **Graduate Researcher, Center for Urban Studies, SUNY Buffalo**
Conducted feasibility analysis for low-income community economic development.

- 2008 **Post-Earthquake Planning Research, Beijing Forestry University**
 Research on infrastructure reconstruction and post traumatic stress disorder mitigation with urban design approaches in Sichuan Province, China.

PUBLICATIONS

Peer-reviewed journal articles

- Lai, Yuan** and Constantine E. Kontokosta. 2019. "Topic Modeling to Discover the Thematic Structure and Spatial-temporal Patterns of Building Renovation and Adaptive Reuse in Cities." *Computers, Environment, and Urban Systems* vol.78. (IF = 3.997)
<https://doi.org/10.1016/j.compenvurbsys.2019.101383>
- Lai, Yuan** and Constantine E. Kontokosta. 2019. "The Impact of Urban Street Tree Species on Air Quality and Respiratory Illness: A Spatial Analysis of Large-Scale, High-Resolution Urban Data," *Health & Place* vol. 56. (IF = 3.736)
<https://doi.org/10.1016/j.healthplace.2019.01.016>
- Lai, Yuan** and Constantine E. Kontokosta. 2018. "Quantifying Place: Analyzing the Drivers of Pedestrian in Dense Urban Environment," *Landscape and Urban Planning* vol. 180. (IF = 4.994) <https://doi.org/10.1016/j.landurbplan.2018.08.018>
- Celi, Leo A., Jeffrey D. Marshall, **Yuan Lai**, and David J. Stone. 2015. "Disrupting Electronic Health Records Systems: The Next Generation," *JMIR Medical Informatics* 3 (4): e34. (IF = 5.175) <https://doi.org/10.2196/medinform.4192>
- Yin, Li, Samina Raja, Xiao Li, **Yuan Lai**, Leonard Epstein, and James Roemmich. 2013. "Neighborhood for Playing: Using GPS, GIS, and Accelerometry to Delineate Areas within which Youth are Physically Active," *Urban Studies* 50 (14):2922-2939. (IF = 2.604)
<https://doi.org/10.1177/0042098013482510>

Peer-reviewed conference proceedings

- Kontokosta, Constantine E., **Yuan Lai**, Bartosz Bonczak, Sokratis Papadopoulos, Boyeong Hong, Awais Malik, and Nicholas Johnson. 2018. "A Dynamic Spatial-Temporal Model of Urban Carbon Emissions for Data-Driven Climate Action by Cities," *Proceedings of the 2018 Bloomberg Data for Good Exchange*, New York, NY. <https://par.nsf.gov/servlets/purl/10083415>
- Lai, Yuan** and Constantine E. Kontokosta. 2017. "Measuring the Impact of Urban Street Trees on Air Quality and Respiratory Illness: A Data-Driven Approach to Environmental Justice," *Proceedings of the 2107 Bloomberg Data for Good Exchange*, New York, NY. <https://arxiv.org/abs/1710.11046>
- Lai, Yuan** and Constantine E. Kontokosta. 2017. "Analyzing the Drivers of Pedestrian Activity at High Spatial Resolution," *American Society of Civil Engineers (ASCE) International Conference on Sustainable Infrastructure*, New York, NY. <https://doi.org/10.1061/9780784481196.027>

Peer-reviewed book chapters

- Lai, Yuan** and David J. Stone. 2019. "Integrated Data Intelligence for Urban Health," Book Chapter in *Data Science and Global Health*. Harvard-MIT Health Sciences and Technology. Springer. (in press)

- Lai, Yuan** and Constantine E. Kontokosta. 2019. "Urban Data Mining: Sources, Types, and Limits," Book Chapter in *Urban Intelligence: How Data and Information Can Shape Urban Planning, Design, and City Operations*. London: Routledge. (in contract)
- Lai, Yuan**, Edward Moseley, Francisco Salgueiro, and David J. Stone. 2016. "Integrating Non-clinical Data with EHRs" in *Secondary Analysis of Electronic Health Records*, MIT Critical Data Group, ed. Springer International Publishing AG.
https://link.springer.com/chapter/10.1007/978-3-319-43742-2_6
- Stone, David J., Justin Rousseau, and **Yuan Lai**. 2016. "Pulling It All Together: Envisioning a Data-Driven, Ideal Care System" in *Secondary Analysis of Electronic Health Records*, MIT Critical Data Group, ed. Springer International Publishing AG.
https://link.springer.com/chapter/10.1007/978-3-319-43742-2_4

Technical report and working paper

- Kontokosta, Constantine E., **Yuan Lai**, Sokratis Papadopoulos, Jacob Sagi, Franz Fuerst, and Gary Pivo. 2019. "Estimating Office and Multifamily Building Energy Retrofit Hurdle Rates and Risk Arbitrage in Energy Efficiency Investments." Working Paper for Real Estate Research Institute & Lawrence Berkeley National Laboratory Research Grant.
https://buildings.lbl.gov/sites/default/files/NYU-CAM-UA-UNC_RERI-LBNL_Working_Paper.pdf
- Kontokosta, Constantine E., **Yuan Lai**, Bartosz Bonczak, Sokratis Papadopoulos, Boyeong Hong, Awais Malik, and Nicholas Johnson. 2017. "Urban Physiology: A Dynamic Spatial-Temporal Model of Urban Carbon Emissions to Drive Climate Action by Cities." Technical report for the United Nations Data for Climate Action Challenge.
- Yuan Lai**, Sreoshy Banerjea, Alison Von Glinow. 2017. "Arrival House: How can we redesign and rethink housing to better integrate the arrival of immigrants to their new city?" Technical report for Urban Design Forum Design for Arrival Program.
<https://urbandedesignforum.org/review/arrival-house/>
- NYC Department of City Planning and NYU CUSP, 2016. "Neighborhood Profiles: Planning and Visualizing for Strategic Growth." Technical report for applied urban science and informatics capstone project.

Manuscripts under review

- Lai, Yuan. 2019. "Hyper-local Urban Contextual Awareness through Open Data Integration." *Per-AwareCity 2020: 5th IEEE International Workshop on Pervasive Context-Aware Smart Cities and Intelligent Transport System*.
- Kontokosta, Constantine E. and **Yuan Lai**. 2019. "Smart, Connected, and Just Communities? A Comparative Case Study in New York City." *Urban Studies*.

INVITED TALKS, CONFERENCE PRESENTATION, MEDIA COVERAGE

- 2019 Panel paper presenter, "Using Big Data and Social Media to Understand Neighborhood Conditions", Association for Public Policy Analysis and Management (APPAM) Annual Research Conference. Nov. 8. <https://appam.confex.com/appam/2019/webprogram/Paper30554.html>

- 2019 Panel moderator, "Community-Based Co-Living in NYC", New York Build Expo. Mar 12. <https://www.newyorkbuildexpo.com/whats-on/full-program>
- 2019 Invited roundtable discussion with American Express, 13th Annual Machine Learning Symposium, The New York Academy of Sciences. New York. Mar 1.
- 2019 Media coverage, "New York City's PollenScape, and What It Says About Air Quality & Environmental Justice." Marron Institute of Urban Management. Feb 13. <https://marroninstitute.nyu.edu/blog/tree-census-nyc>
- 2018 Panel moderator, "Arrival House: An Integrated Co-Living Model for New Arrivals to NYC." American Planning Association, New York Metro Annual Conference. Nov 16.
- 2018 Panel speaker, "Big Data for Local Climate Change." MetroLab Network Summit, Newark, NJ. Oct 16. https://metrolabnetwork.org/wp-content/uploads/2018/10/MetroLab2018-Summit-Agenda_External.pdf
- 2018 Panel speaker, "Design for Arrival: A Co-Live Scenario for Newly Arrived Immigrants to New York City." Urban Design Forum. New York, NY. Apr 18. <https://urbandedesignforum.org/review/arrival-house/>
- 2017 Media coverage, "Data for Good: Bloomberg supports data scientists' work with nonprofits and municipalities to solve real-world problems" by NYC Media Lab. Oct 31. <https://medium.com/@nycmedialab/data-for-good-bloomberg-supports-data-scientists-work-with-nonprofits-and-municipalities-to-solve-6d9ce6360ea8>
- 2017 Conference presenter, "Analyzing the drivers of pedestrian activity at high spatial resolution." International Conference on Sustainable Infrastructure, American Society Of Civil Engineers. Oct 26. <https://ascelibrary.org/doi/book/10.1061/9780784481196>
- 2017 Panel speaker, "Informatics for business improvement district operation: Grand Central Partnership." Bloomberg Data for Good Exchange. New York, NY. Sep 16. <https://www.youtube.com/watch?v=YMvNxCT3Pg>
- 2017 Conference presenter, "Measuring the impact of urban street trees on air quality and respiratory illness." Bloomberg Data for Good Exchange. New York, NY. Sep 16. <https://www.youtube.com/watch?v=WxXzpvT32Io>
- 2017 Media coverage, "Bloomberg AR Fellows Prototype Possible Future for Augmented Reality in the Enterprise." Tech at Bloomberg, Aug 1. <https://www.techatbloomberg.com/blog/bloomberg-ar-fellows-prototype-possible-future-augmented-reality-enterprise/>
- 2017 Media coverage, "U.S. Foreign Policy Colloquium Alumni Profiles: Yuan Lai." The National Committee on United States-China Relations. <https://www.ncuscr.org/program/us-foreign-policy-colloquium/yuan-lai-2017>
- 2017 Panel speaker, "Data interface with AR in future work environment." Tech at Bloomberg. New York, NY. May 15.
- 2016 Media coverage, "Students Develop Tech Ideas into Reality at HackNYU 2016." New York University Website. Mar 4. <https://engineering.nyu.edu/news/students-develop-tech-ideas-reality-hacknyu-2016>

PROFESSIONAL EXPERIENCE

NYC Department of City Planning, Capital Planning Division | 2015 Dec-2016 Feb, New York
Intern analyst, developed quantitative metrics for neighborhood assets investment assessment. Consulted on data analysis pipeline and visualization platform for budget allocation.

Moshe Safdie and Associates | 2011 Jul-2015 Aug, Cambridge, MA
Architect/urban designer, performed master planning and urban design for projects in Singapore, China, Israel, Canada, Greece, Turkey, and Colombia.

Turenscape, Peking University | 2008 Dec-2009 Feb, Beijing
Intern landscape architect and planner to work with Dr. Kongjian Yu (Harvard GSD) on urban design projects in Su Zhou, China.

Da Ming Palace National Heritage Park Development Office | 2007 May-Aug, Xi'an, China
Intern project manager, in charge of design competition bidding, communication with international design companies and presentation to the Mayor's office.

TECHNICAL SKILLS & METHODS

Data Science | Applied Analytics: Data mining, data wrangling, machine learning, natural language processing, risk analysis, decision modeling, time-series analysis, network analysis

Programming | IoT: Python with various libraries (Pandas, GeoPandas, NumPy, SciPy, Matplotlib, Statsmodels, Scikit-Learn, Seaborn, NLTK, TensorFlow), R, SQL, HTML, JavaScript, web scraping, Postgres, IoT prototyping with Arduino + p5.js + various sensors

GIS | Visualization | Big Data: Arc GIS, QGIS, PostGIS, CartoDB, D3, Tableau, Leaflet, Plotly, MapReduce, Hadoop, Apache Spark

Planning | Design | Engineering: Auto CAD, Revit, Rhino, SketchUp, Grasshopper, laser and 3D printing, Solibri, Navisworks, Oracle Primavera, Oracle Crystal Ball, Adobe Creative Suite

SERVICES

Manuscript Reviewer

Urban Studies

Landscape and Urban Planning

ACM Transactions on Spatial Algorithms and Systems

PLOS One

Sustainable Cities and Society

International Journal of Health Geographics

China National Knowledge Infrastructure (CNKI)

Civil Society

Committee Member, Urban Design Forum, New York

Volunteer, Center for Legal Assistance to Pollution Victims, Beijing

AFFILIATIONS

Forefront Fellow, Urban Design Forum

Member, American Society of Civil Engineers

Member, Urban Land Institute

Member, Association for Policy Policy Analysis & Management

Member, The New York Academy of Medicine

CREDENTIALS

LEED Accredited Professional, US Green Building Council

Lean Launchpad for Applied Tech Commercialization, NYU Entrepreneurial Institute

Deep Learning Specialization, deeplearning.ai

Data Scientist Python Tracks, DataCamp

Data Scientist R Tracks, DataCamp

LANGUAGES

English and Mandarin Chinese, fluent in speaking and writing

Last updated: November 15, 2019