

## Yuan Lai

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<b>EDUCATION</b>	<b>New York University</b> <span style="float: right;"><b>2019</b></span> <i>Ph.D.</i> , Civil Engineering in Urban Systems and Informatics Dissertation: Integrated urban informatics - multidimensional data intelligence at high resolution (Advisor: Constantine E. Kontokosta) Minors: Data Science + Construction Management + Interactive Telecommunication
	<b>New York University, Center for Urban Science and Progress</b> <span style="float: right;"><b>2016</b></span> <i>M.S.</i> , Applied Urban Science and Informatics
	<b>University at Buffalo, State University of New York</b> <span style="float: right;"><b>2011</b></span> <i>M.S.</i> , Urban Planning (GIS + Urban Design)
	<b>Beijing Forestry University</b> <span style="float: right;"><b>2009</b></span> <i>B.S.</i> , Landscape Architecture, a minor in Law
<b>ACADEMIC APPOINTMENT &amp; TEACHING</b>	<b>Massachusetts Institute of Technology</b> <span style="float: right;"><b>2019-present</b></span> <b>School of Urban Studies and Planning</b> Lecturer in Urban Science and Planning at Department of Urban Studies and Planning, teaching undergrad/grad level subjects on applied data science for cities.
	<b>Massachusetts Institute of Technology</b> <span style="float: right;"><b>2019-present</b></span> <b>School of Engineering</b> Co-faculty lead for New Engineering Education Transformation Digital Cities thread.
	<b>Harvard-MIT Health Sciences and Technology (HST)</b> <span style="float: right;"><b>2019 February</b></span> Guest lecture "Urban Informatics and Big Data for Quality-of-Life" for a graduate course HST.936: Leveraging Data Science in Global Health.
	<b>MIT + Taipei Medical University Health IoT Hackathon</b> <span style="float: right;"><b>2018 October</b></span> Data science mentor and competition judge for a four-day hackathon in Taipei.
	<b>Taipei Medical University</b> <span style="float: right;"><b>2018 October</b></span> <b>School of Management Data Science Institute</b> Guest lecture "Urban Informatics and Applied Data Science for Cities".
	<b>New York University</b> <span style="float: right;"><b>2018 Spring</b></span> <b>Center for Urban Science and Progress</b> Mentor for a Master's 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 analyze population dynamics and the use of public space.
	<b>New York University</b> <span style="float: right;"><b>2017 Fall</b></span> <b>Center for Urban Science and Progress</b> 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.

**Columbia University** **2017 February**  
**Graduate School of Architecture, Planning and Preservation**  
 Guest lecture “Advanced Data Analytics for Urban Planning and Design” for a graduate urban design course “Algorithms and Urbanism”.

**University at Buffalo, State University of New York** **2011 Fall**  
**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.

**HONORS &  
 FELLOWSHIPS**

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

## RESEARCH EXPERIENCE

**NYU Marron Institute of Urban Management** **2019**  
Research Affiliate, designed analytical approach using Natural Language Processing for knowledge discovery in construction activity and development patterns. Work is supported by Real Estate Research Institute and Lawrence Berkeley National Laboratory.

**NYU Urban Intelligence Lab** **2015-2019**  
Doctoral Research Assistant, performed data science research in mobility patterns, development change, building energy economics, and infrastructure impact evaluation.

**Department of Architecture, SUNY Buffalo** **2010-2011**  
Graduate Research Assistant, developed a spatial analytics method and master plan for brownfield redevelopment.

**Urban Design Project, SUNY Buffalo** **2010-2011**  
Graduate Researcher, performed zoning research and facilitated community participatory planning.

**Center for Urban Studies, SUNY Buffalo** **2009-2010**  
Graduate Researcher, conducted feasibility analysis for low-income community economic development.

**Beijing Forestry University** **2008**  
Post-earthquake planning research on infrastructure reconstruction and post traumatic stress disorder mitigation with urban design approaches in Sichuan, China.

## PUBLICATIONS Peer-reviewed Journal Articles

1. **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>
2. **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>
3. **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>
4. 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>
5. 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

6. 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>
7. **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>
8. **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

9. **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)
10. **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)
11. **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](https://link.springer.com/chapter/10.1007/978-3-319-43742-2_6)
12. 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](https://link.springer.com/chapter/10.1007/978-3-319-43742-2_4)

## Technical Report and Working Paper

13. 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-UANC\\_RERI-LBNL\\_Working\\_Paper.pdf](https://buildings.lbl.gov/sites/default/files/NYU-CAM-UANC_RERI-LBNL_Working_Paper.pdf)
14. 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.

15. **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://urbandesignforum.org/review/arrival-house/>

16. 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

17. **Lai, Yuan**. 2019. "Hyper-local Urban Contextual Awareness through Open Data Integration." *PerAwareCity 2020: 5th IEEE International Workshop on Pervasive Context-Aware Smart Cities and Intelligent Transport System*.

18. Kontokosta, Constantine E. and **Yuan Lai**. 2019. "Smart, Connected, and Just Communities? A Comparative Case Study in New York City." *Urban Studies*.

#### Manuscripts in Preparation

19. Kontokosta, Constantine E., Lance Freeman, **Yuan Lai**. 2019. "Using Big Data and Social Media to Understand Neighborhood Conditions", *Journal of Planning Education and Research*.

**CONFERENCE PRESENTATION MEDIA COVERAGE & INVITED TALKS**    **APPAM 41th Annual Research Conference, Denver**    **Nov. 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. <https://appam.confex.com/appam/2019/webprogram/Paper30554.html>

**MIT News**    **Oct. 2019**  
Media coverage, "Exploring Urban Science." MIT News. <https://dusp.mit.edu/news/exploring-urban-science>

**NOMA Annual Conference**    **Oct. 2019**  
Panel moderator, "Arrival House: an Integrated Co-Living Model for New Arrivals to NYC ", The National Organization of Minority Architects (NOMA) Annual Conference, New York.

**New York Build Expo, New York**    **Mar. 2019**  
Panel moderator, "Community-Based Co-Living in NYC" <https://www.newyorkbuildexpo.com/whats-on/full-program>

**13th Annual Machine Learning Symposium, New York**    **Mar. 2019**  
Invited round table discussion with American Express hosted by The New York Academy of Sciences. New York.

**Marron Institute of Urban Management**    **Feb. 2019**  
Media coverage, "New York City's PollenScape, and What It Says About Air Quality & Environmental Justice." <https://marroninstitute.nyu.edu/blog/tree-census-nyc>

**American Planning Association, NYC Annual Conference**    **Nov. 2018**  
Panel moderator, "Arrival House: Integrated Co-Living for New Arrivals to NYC."

**MetroLab Network Summit, Newark** **Oct. 2018**  
 Panel speaker, "Big Data for Local Climate Change." [https://metrolabnetwork.org/wp-content/uploads/2018/10/MetroLab2018-Summit-Agenda\\_External.pdf](https://metrolabnetwork.org/wp-content/uploads/2018/10/MetroLab2018-Summit-Agenda_External.pdf)

**Urban Design Forum, New York** **Oct. 2018**  
 Panel speaker, "Design for Arrival: A Co-Live Scenario for Newly Arrived Immigrants to New York City." <https://urbandesignforum.org/review/arrival-house/>

**NYU Urban Research Day, New York** **Mar. 2018**  
 Poster session, "Quantifying Places" at New York University Urban Research Day.

**NYC Media Lab** **Oct. 2017**  
 Media coverage, "Data for Good: Bloomberg supports data scientists' work with nonprofits and municipalities to solve real-world problems" <https://medium.com/@nycmedialab/data-for-good-bloomberg-supports-data-scientists-work-with-nonprofits-and-municipalities-to-solve-6d9ce6360ea8>

**ASCE International Conference on Sustainable Infrastructure** **Oct. 2017**  
 Conference presenter, "Analyzing the drivers of pedestrian activity at high spatial resolution." American Society Of Civil Engineers (ASCE). Oct 26. <https://ascelibrary.org/doi/book/10.1061/9780784481196>

**Bloomberg Data for Good Exchange, New York** **Sep. 2017**  
 Panel speaker, "Informatics for business improvement district operation: Grand Central Partnership." <https://www.youtube.com/watch?v=YMvNx3Cct3Pg>

**Bloomberg Data for Good Exchange, New York** **Sep. 2017**  
 Conference paper presenter, "Measuring the impact of urban street trees on air quality and respiratory illness." <https://www.youtube.com/watch?v=WxXzpvT32I0>

**Tech at Bloomberg, New York** **Sep. 2017**  
 Media coverage, "Bloomberg AR Fellows Prototype Possible Future for Augmented Reality in the Enterprise." <https://www.techatbloomberg.com/blog/bloomberg-ar-fellows-prototype-possible-future-augmented-reality-enterprise/>

**The National Committee on United States-China Relations** **Jul. 2017**  
 Media coverage, "U.S. Foreign Policy Colloquium Alumni Profiles: Yuan Lai." <https://www.ncuscr.org/program/us-foreign-policy-colloquium/yuan-lai-2017>

**Tech at Bloomberg, New York** **May 2017**  
 Panel speaker, "Data interface with AR in future work environment."

**New York University News** **Mar. 2016**  
 Media coverage, "Students Develop Tech Ideas into Reality at HackNYU 2016." <https://engineering.nyu.edu/news/students-develop-tech-ideas-reality-hacknyu-2016>

**MIT Senseable City Lab** **Jul. 2014**  
 Guest speaker for a research presentation "Urban Design with Big Data".

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

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

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

**DaMing Palace National Park Development Office, Xi'an** **May-Aug 2007**  
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/Analytics:** Data mining, data wrangling, machine learning, natural language processing, risk analysis, decision modeling, time-series, 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

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

**SERVICES**

**Committee Service**

Urban Science Committee, MIT DUSP 2019 – present  
Open Data Science Conference Boston Content Committee 2019 – 2020  
Urban Design Forum Committee, New York 2019 – present

**Manuscript Reviewer**

*Urban Studies*  
*Landscape and Urban Planning*  
*Sustainable Cities and Society*  
*ACM Transactions on Spatial Algorithms and Systems*  
*PLOS One*  
*International Journal of Health Geographics*  
*China National Knowledge Infrastructure (CNKI)*

**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

**CERTIFICATION**

**LEED Accredited Professional** by US Green Building Council  
**Lean Launchpad for Applied Tech Commercialization** by NYU Leslie eLab  
**Deep Learning Specialization** by deeplearning.ai  
**Data Scientist Python Tracks** by DataCamp  
**Data Scientist R Tracks** by DataCamp