

UNCHITTA KAN

Name may appear as “Alexi Unchitta Kan” or “Unchitta Kanjanasaratool”

Presidential Fellow / PhD Student / Graduate Research Assistant
Computational Social Science, Dept. of Computational and Data Sciences
George Mason University (Fairfax, VA)

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SUMMARY

I use data, computation, and an interdisciplinary approach to study cities and urban systems, often involving complexity theory, GIS, social demography, and survey statistics. My PhD work investigates, from the population perspective, what makes cities distinctive, resilient, and successful. I am also passionate about applying complex systems thinking to policy problems and bringing my years of experience in data science to making cities more equitable and sustainable.

EDUCATION

- PhD** **George Mason University** *Aug 2020 – Present*
Computational Social Science, GPA: 3.98
Interdisciplinary areas of study: Urban Sociology & Geography, Demography, Urban Policy, Urban Inequity, Complexity Theory for Public Policy, Agent-based Modeling, GIS & Mapping, Network Science
Technical activities:
 - Quantitative research using Python and R
 - Analyses of large-scale national household and microdata
 - Survey weighting and survey methods
 - Systems and simulation modeling
 - GIS, mapping, and interactive web-mappingAdvisor: Prof. Eduardo Lopez
- BS** **University of California, Los Angeles (UCLA)** *Sep 2018 – Jun 2020*
Applied Mathematics, GPA: 3.46
Coursework: Modeling, Network Science, Machine Learning, Probability Theory & Mathematical Statistics, Stochastic Processes, Optimization
Research and study topics: Simulation model of co-evolution of public opinion and social networks; Interpretable machine learning
Research mentors: Prof. Mason Porter & Dr. Michelle Feng
- AS** **Foothill College** *Sep 2016 – Jun 2018*
Mathematics & Computer Science, GPA: 3.88
Dean’s List

ACADEMIC & INDUSTRIAL POSITIONS

- George Mason University** *Aug 2020 – Present*
Presidential Fellow & Graduate Research Assistant,
Department of Computational and Data Sciences
Fairfax, VA
- Clover Network, Inc** *Jun 2021 – Aug 2021*
Data Science Intern
Sunnyvale, CA
Activities: Data science involving SQL (Snowflake & Sigma), recommendation systems and machine learning with Python, development of automated testing and dashboard tools

Institute for the Quantitative Study of Inclusion, Diversity, and Equity (QSIDE Institute)
Research Intern

Jun 2020 – Aug 2020
Williamstown, MA

University of California, Los Angeles
Undergraduate Student Researcher

Sep 2019 – Jun 2020
Los Angeles, CA

Clover Network, Inc
Data Science Intern

Jun 2019 – Aug 2019
Sunnyvale, CA

Clover Network, Inc
Data Analyst Intern

Jul 2018 – Sep 2018
Sunnyvale, CA

RESEARCH IN PREPARATION

- U. Kan, J. McLeod, and E. López (2023). “Non-coresident family as a driver of migrational change in a crisis: The case of the COVID-19 pandemic.” (*in prep*).

PUBLICATIONS

Peer-reviewed journal articles

- U. Kan, M. Feng, and M. Porter (2023). “An adaptive bounded-confidence model of opinion dynamics on networks.” *Journal of Complex Networks*, 11 (1). <https://doi.org/10.1093/comnet/cnac055>

Conference Proceedings

- U. Kan and E. López (2021). Layered Hodge Decomposition for Urban Transit Networks. In *International Conference on Complex Networks and Their Applications* (pp. 804-815). Springer, Cham. https://doi.org/10.1007/978-3-030-93413-2_66

Preprints

- J. McLeod, U. Kan, and E. López (2023). “Origins of Face-to-face Interaction with Kin in US Cities.” <https://doi.org/10.48550/arXiv.2305.07944>
- C. M. Topaz, H. Z. Brooks, U. Kan, B. Sandstede, and C. M. Smith (2023). “Diversity, Identity, and Data.” <https://doi.org/10.31235/osf.io/hs723>

Expository Publications in Journal and Magazines

- H. Brooks, U. Kanjanasaratool, Y. Kureh, and M. A. Porter (2021). “Disease Detectives: Using Mathematics to Forecast the Spread of Infectious Diseases.” *Frontiers for Young Minds*. 9:577741. <https://doi.org/10.3389/frym.2020.57774>

UNPUBLISHED PROJECTS

- U. Kan (2023). “Detection of local spatial clustering of amenities in Washington, DC using an inhomogeneous null model.” (*in prep*).
- U. Kan (2022). Transit Accessibility Explorer: A Web Map for Exploring Accessibility by Public Transit in Washington, DC. ([demo screenshot](#) | [presentation slides](#))
- U. Kan (2022). An Agent-Based Model of the Spatial Mismatch Hypothesis. (Presented at George Mason University Graduate Interdisciplinary Conference, April 2023).

HONORS AND AWARDS

Presidential Fellowship
George Mason University

2020 - Present

Graduate Student Travel Fund (\$500) George Mason University	2021
Successful Participant COMAP Mathematical Contest in Modeling	2020
Excellence in STEM (Mathematics) Award Foothill College	2018

TEACHING EXPERIENCE

Mathematics & Statistics Tutor Foothill College (Los Altos Hills, CA), EOPS Program	<i>Oct 2017 - Jun 2018</i>
<ul style="list-style-type: none"> • Tutored college-level mathematics and statistics to underrepresented students in the EOPS program. Hired based on professors' recommendations. 	

ACTIVITIES/PARTICIPATION

- Presenter - George Mason University Graduate Interdisciplinary Conference, April 2023.
- Presenter - The 8th International Conference on Computational Social Science, July 2022.
- Presenter - George Mason University Graduate Interdisciplinary Conference, April 2022.
- Presenter - The 10th International Conference on Complex Networks and their Applications, December 2021.
- Presenter - SIAM Dynamical Systems Conference, May 2021.
- Panelist & Participant - ICERM Computational Approaches to Social Justice Workshop, March 2021.
- Participant: American Mathematical Society Short Course "Mathematical and Computational Methods for Complex Social Systems," January 2021.
- Participant - UCLA IDRE Census Data Analysis and Mapping with Python Workshop, January 2021.
- Contestant - COMAP's Mathematical Contest in Modeling, March 2020.
- Participant - UCLA Department of Mathematics Directed Reading Program, AY20218-2019.
- Contestant - Stanford University TreeHacks Hackathon, February 2018.
- Contestant - NASA Space Apps Challenge (Palo Alto, CA), April 2017.

NON-CONFERENCE PRESENTATIONS

- *Getting Map Data from OpenStreetMap: OSM Data Model & Querying*. GMU GGS 692, March 2022. ([slides](#))
- (Paper discussion) *The Effects of Social Networks on Employment and Inequality (Calvo-Armengol & Jackson 2004)*. GMU CSS 695 Agent-based Modeling in Economics, September 2020.
- *Coevolving bounded confidence: modeling opinion dynamics on adaptive social networks with homophily (working paper)*. UCLA Networks Journal Club, May 2020.
- *Graph-based Recommendation Systems*. UCLA Networks Journal Club, Feb 2020.
- *Innovating Preferential Attachment Models to Study Innovation Networks*. UCLA Math 168 Final Project Paper Presentation, June 2019.
- *Interpretability in Machine Learning & Sparse Linear Regression*. UCLA Department of Mathematics Directed Reading Program, Quarter-end Presentation, Jan 2019.
- *Principal Component Analysis: A Mathematical Introduction*. Foothill College Independent Study Presentation, June 2018.

PROFESSIONAL MEMBERSHIPS

- Women in Network Science Society, 2020-2021. Member.
- Institute for the Quantitative Study of Inclusion, Diversity, and Equity, 2020-2021. Research Affiliate.
- UCLA Networks Journal Club, 2019-2020. Member.
- UCLA Women in Mathematics, 2018-2019. Member.

SKILLS

Data and computation:

Analysis of large-scale household data such as Census PUMS, CPS, ATUS
Python, pandas, numpy, matplotlib, seaborn
Survey weighting and methods
SQL and relational database design
Object-oriented Programming
Agent-based modeling and simulation
Network Analysis with Python and NetworkX
Dashboards
Data science & machine learning (Python, sklearn)
Familiar: R, Julia, HTML/CSS, JavaScript

GIS & Mapping:

Mapping and spatial analysis with Python
Basic interactive web mapping with JavaScript and Mapbox using spatial databases
OpenStreetMap queries
Analysis using transit and street network data
Spatial statistics

Other:

Familiarity with Census data products and structure
Systems thinking
Writing for general audience
Scientific communication
Report preparation in LaTeX
Policy analysis

Domain knowledge:

Cities and urban systems in the U.S.
Social demography
Urban inequality in the U.S.
Sustainable transportation issues and policy in the U.S.

Languages: English (primary), Thai (native)

OTHER

Scientific blogging at unchitta.com/blog

Citizenship: THAI