UNCHITTA KAN

Name may appear as (Alexi) Unchitta Kan or Unchitta Kanjanasaratool

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

Homepage: unchitta.com
ukanjana@gmu.edu
Updated: March 1, 2024

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 sociological and 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-mapping

Advisor: 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, *Fairfax, VA*
Department of Computational and Data Sciences

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) — **Jun 2020 – Aug 2020**
Research Intern — *Williamstown, MA*

University of California, Los Angeles — **Sep 2019 – Jun 2020**
Undergraduate Student Researcher — *Los Angeles, CA*

Clover Network, Inc — **Jun 2019 – Aug 2019**
Data Science Intern — *Sunnyvale, CA*

Clover Network, Inc — **Jul 2018 – Sep 2018**
Data Analyst Intern — *Sunnyvale, CA*

Research in Preparation

- U. Kan (2024). "Who gets to interact and why? A framework for analyzing face-to-face social interaction in cities." (*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

- 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." https://arxiv.org/abs/2310.03254. *(R&R at Nature Humanities and Social Sciences Communications)*
- 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. *(in prep)*
- 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. *(Accepted into the American Mathematical Monthly)*

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."

- 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 — 2020 - Present
George Mason University

Graduate Student Travel Fund ($500) — 2021
George Mason University

Successful Participant — 2020
COMAP Mathematical Contest in Modeling

Excellence in STEM (Mathematics) Award — 2018
Foothill College

Teaching Experience

Mathematics & Statistics Tutor — *Oct 2017 - Jun 2018*
Foothill College (Los Altos Hills, CA), EOPS Program
- 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/preferred), Thai (native)

Other

Scientific blogging at unchitta.com/blog
Citizenship: Thai