

THE CENTER FOR URBAN AND REGIONAL ANALYSIS



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THE OHIO STATE UNIVERSITY

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CENTER FOR URBAN AND REGIONAL ANALYSIS

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LETTER FROM **THE DIRECTOR**



2020 is guite the year. As I write this letter, we are living through an historic pandemic that will fundamentally change our lives, our cities and our planet. 2020 is also the sesquicentennial of The Ohio State University. For both negative and positive reasons, 2020 is a time to reflect on how we move beyond the immediate crisis to a world beyond.

A global crisis like COVID-19 demands both immediate action and learning lessons for the future. The Center for Urban and Regional Analysis (CURA) and Ohio State are contributing to efforts, in Ohio and beyond, to understand the pandemic and its broader implications. We currently have several projects underway to help us understand how pandemics spread, how economies behave under stress and how public transit is enabling essential mobility. We are also working with other campus entities, including the Translational Data Analytics Institute and the Sustainability Institute, to develop better data infrastructure, both immediately for COVID-19 and longer term for other impending shocks. This will allow Ohio State researchers to respond quickly with new, problemdriven research and collaborations, both on campus and in the community.

As we close the first 150 years of Ohio State, we see progress in its evolution as an urban university, including the creation of CURA in 2001 and the simple but powerful addition of the word "urban" to its mission statement in 2016. The 21st century is the first majority urban century in humanity's history, and we face profound challenges in creating innovative, inclusive and environmentally-friendly cities and regions that can gracefully handle shocks such as pandemics and climate change. Ohio State has a strong collaborative culture and a keen sense of social responsibility, as reflected in the university motto, "Education for Citizenship." Our current crisis and its disruptions make apparent the unsustainable and brittle trajectories many communities were following. We can learn from this crisis to be better citizens, not just of our local communities, but of the entire world.

In this annual report, you will read about research projects and outreach activities on questions and issues facing cities and regions as we strive for a more sustainable and resilient future. We are also passionate advocates for the geospatial data and spatial analytics that enable new kinds of convergent urban science. This new science can help address the challenges of our current crisis and teach us how to be stronger as we move forward. Perhaps in the future, people will say, "The coronavirus crisis of 2020 was terrible, but we learned and it saved us."

Regards,

HARVEY J. MILLER, PHD DIRECTOR



DEAR FRIENDS OF CURA,

ABOUT CURA

Founded in 2001, the Center for Urban and Regional Analysis (CURA) has worked for over 15 years to address the opportunities and challenges facing neighborhoods and communities. Part of the College of Arts and Sciences but working with partners across campus and in the community, CURA has a strong interdisciplinary and collaborative culture necessary to understand the complex issues facing cities and regions and help make progress toward a more sustainable world.

We are an innovation hub specializing in the application of Geographic Information Science (GIScience), spatial analysis and geographic visualization to urban issues ranging from modeling and analyzing the impacts of public and private investments on the urban fabric to mapping the social determinants of the opioid epidemic.

Our mission is to serve as a transdisciplinary research and outreach hub that specializes in geospatial science to better understand the issues and challenges facing cities and regions in Ohio and beyond.

CURA BY THE NUMBERS



ACTIVITY AREAS

STUDENT ENGAGEMENT

CURA's graduate and undergraduate researchers are among the best GIS and urban science students in the world. Involvement in our research projects enhances their educational experience and provides exposure to a professional setting. Our students not only work on cutting-edge research projects but also participate in scientific conferences and publishing, providing local, national and international exposure. Experience gained at CURA provides students with a skillset that distinguishes them from other candidates when seeking employment.

OUTREACH AND EDUCATION

We work closely with campus partners to host events and workshops of interest to professionals in GIScience and urban studies, as well as the general public. CURA hosts a series of speakers from academia, the private sector, government and foundations during the academic year. Our speaker series is highly engaging and dynamic, introducing students, faculty and community members to emerging topics in the fields of urban science and practice. To further the land grant mission of Ohio State, we engage with organizations in the community to share our technical expertise in spatial and temporal analysis and mapping. This past year, we expanded our partnerships with central Ohio organizations to include the Mid-Ohio Regional Planning Commission (MORPC) and the Central Ohio Transit Authority (COTA).

RESEARCH SUPPORT

Our researchers create sophisticated analyses and models to help understand the spatiotemporal patterns hidden in data. We also help researchers communicate their findings to their audiences more effectively using maps, charts, interactive applications and other visualization tools. We manage a high-performance computing environment that is optimized for analysis of large geospatial datasets.

TOOL AND APPLICATION DEVELOPMENT

Staff and research assistants at CURA are skilled in the development of special-purpose geospatial data science, spatial analysis, and mapping tools and applications. Our customers leverage our expertise in geocomputational algorithm development, database design and user interface definition to create custom solutions tailored to their specific needs, whether those needs involve simplifying their analysis or communicating findings with their intended audience.

SERVICES

CURA serves as an innovation hub that brings together researchers from across campus to integrate spatial analysis and modeling and Geographic Information Science (GIScience) into social, natural and environmental sciences; applied economics; agriculture; engineering; health and medical professions; and the humanities. We possess strong technical expertise in many fields related to geospatial data science and urban science.

Our services are provided to clients on campus and in the community. In a fee-for-service model, CURA charges an hourly rate and provides a detailed project proposal that defines the scope of work, budget and timeline. CURA also participates in the development of funding proposals and projects, with CURA faculty and staff serving in varying roles.

CURA provides the following services:

- Collaboration on Grant Proposals
 and Projects
- Custom Tool and Application
 Development
- Data Conversion
- Data Hosting
- Database Design
- Digitization and Geo-referencing
- Geocoding
- GIS Customization and Automation Using Python and Other Tools
- Mapping
- Spatial Analysis
- Educational Seminars and Workshops
- Speaker Series

MAPPING

We create static and interactive maps using state-of-the-art tools and sound cartographic principles to help our customers achieve the greatest impact with their target audience. Effective cartography is all about making the right choices, and we help customers understand which technology, presentation and design options are ideal for their needs.

SPATIAL ANALYSIS

Recent advances in computing, GIS technologies and data availability allow for increasingly nuanced understanding of spatiotemporal patterns. Decisions today are increasingly data-driven, and spatial analysis helps us make decisions based on the results.

CUSTOM TOOL AND APPLICATION DEVELOPMENT

We develop custom web and mobile applications tailored to any audience so even non-experts can leverage the power of mapping and spatial analysis. We also develop tools to simplify the collection of multimedia spatial data. **PROJECTS**

CURA participates in projects that help fulfill Ohio State's urban mission. Recent projects have focused on the following areas of research:

- 1. Public health
- 2. Social equity
- 3. Sustainability
- 4. Transportation

While many of our projects are long-term — spanning one year or more — we recognize our role as an authority for GIScience on campus and try to accommodate smaller-scale opportunities to support researchers as well.

2019-2020 has brought new and exciting research pathways that have allowed us to build upon existing skills. CURA is currently working on 12 different projects both at Ohio State and in the local community. CURA has also worked across many fields of academia to offer our expertise in spatial and temporal analysis, web-based mapping tool and app development.



CAMPUS SUSTAINABILITY MAP

A web map highlighting sustainability-related features and projects across campus, and optimized for embedding into existing websites and other web maps. This project was funded by a grant from the Sustainability Institute.

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FRANKLIN COUNTY OPIOID CRISIS ACTIVITY LEVELS (FOCAL) MAP

FOCAL Map, an interdisciplinary collaboration with researchers from across campus and EMS agencies throughout the county to map opioid overdose incidents with high spatiotemporal resolution and visualize them in the context of relevant socioeconomic and administrative data. This project has been supported by The Ohio State University Provost's Opioid Innovation Fund and an Overdose Data to Action grant funded by the Centers for Disease Control and administered by Franklin County Public Health.



POULTRY DISEASE MAP

Custom ArcGIS web map application that shows the relation of bird disease to farms in Ohio. The data displayed is simulated to show how the application works.

NEW PROJECTS TO WATCH:

GEOHAI (HOSPITAL ACQUIRED INFECTION)

A web application that uses spatial modeling to help Wexner Medical Center staff detect and mitigate outbreaks of infections.

PROJECT PROFILE: REGIONAL SUSTAINABILITY DASHBOARD

CURA and the Mid-Ohio Regional Planning Commission (MORPC) are launching an interactive, online dashboard that provides current and accurate information on Central Ohio's sustainability accomplishments.

The Regional Sustainability Dashboard serves as the official status report for Central Ohio's progress toward the Regional Sustainability Agenda, which sets the framework for communities and regional partners to work toward common goals. It was created out of the need for greater access to data and information in order to shed light on the impacts of collective sustainability efforts across the 15-county region. The dashboard is intended for use by anyone with an interest in the sustainability of the region, including planners, elected officials, researchers, the media, the public, and you!

The sustainability measures displayed on the dashboard are derived from MORPC data and authoritative third-party data and has undergone thorough quality checks. The



SUSTAINABLE COLUMBUS OBSERVATORY

A long-term initiative in collaboration with a transdisciplinary group of partners across campus to create a longitudinal data warehouse, analytical web application and associated research agenda to benchmark sustainability-related indicators in central Ohio and leverage opportunities to perform natural experiments.

measures are updated as often as practical, depending on the nature of the data and the release cycles of the data providers. The data and processes used to compute the measures are fully documented and are available via links provided on the dashboard.

The data is made available for display on the dashboard as soon as the automatic ingestion process is complete. Whenever new input data is available, ingestion can be triggered again manually, or it can be triggered automatically according to a schedule or some external event.

Thanks to the flexibility built in to the ingestion pipeline, we are confident that it will be able to accommodate the forthcoming updates to the MORPC Regional Sustainability Agenda, and perhaps it even can be adapted for unrelated CURA projects in the future. The dashboard can be accessed at *rsd.morpc.org*. It will be regularly updated as more data and information on the region's progress becomes available.



INTERNAL NETWORK (OHIO STATE):

Urban life intersects with nearly every discipline, a reality that positions CURA perfectly for collaborative projects. As the only interdisciplinary hub on campus for urban issues and mapping, the center works to bring diverse researchers together and create synergy around the study of urban and regional systems.

Departments and Programs:

- Agricultural, Environmental and Development Economics | College of Food, Agriculture and Environmental Sciences – 1
- Art | College of Arts and Sciences 2
- Austin E. Knowlton School of Architecture | College of Engineering – 3
- Civil, Environmental and Geodetic Engineering | College of Engineering – 4
- College of Public Health 5
- Computer Science | College of Engineering 6
- Environmental Health Sciences 7
- Geography | College of Arts and Sciences 8
- John Glenn College of Public Affairs 9
- School of Health and Rehabilitation Sciences | College of Medicine – 10
- Sociology | College of Arts and Sciences 11

Centers and Institutes:

- Byrd Polar & Climate Research Center 12
- Institute for Population Research (IPR) 13
- Kirwan Institute for the Study of Race & Ethnicity 14
- STEAM Factory 15
- Sustainability Institute 16
- Translational Data Analytics Institute 17

Non-Academic Units:

- Marketing and Communications | College of Arts and Sciences – 18
- Corporate Engagement Office 19
- Government Resources Center | College of Medicine 20
- Initiative for Food and AgriCultural Transformation (InFACT) | Office of Academic Affairs – 21
- Office of Academic Affairs 22
- OSU Extension | College of Food, Agriculture and Environmental Sciences – 23
- Planning, Architecture and Estate | Facilities Information Technologies Services – 24
- Smart Campus 25
- Technology Services | College of Arts and Sciences 26
- University Libraries 27
- Wexner Medical Center 28

- Association (URISA) 10



Coffee with CURA is an opportunity for students, faculty and staff to stop in and discuss their geospatial analysis needs with CURA staff and other interested parties. This event is designed to be a forum for researchers at all expertise and experience levels to meet with us and each other to discuss ideas in an informal setting. Through this forum we are often able to help researchers answer their minor questions on the spot, and discussions of larger questions often lead to projects and other avenues for collaboration.

EVENTS CURA is involved in many university events through our partnerships with affiliated departments, programs, collaborating centers and institutes ranging from Westfest, which is held annually, to Women in Data Science Summer camp held every summer. CURA also participates in tabling sessions when possible. We strive to enhance our presence on campus and in the local community through events and workshops.

OUTREACH AND ENGAGEMENT

CURA organizes multiple events each semester designed to apply to a wide range of urban-related interests. From urban policy to time geography, CURA's event series offers engaging and enlightening content across the full spectrum of academia. Events are open to the OSU community and the local community. As the university's hub for GIS and urban data science, CURA seeks to bridge the campus community with professionals around Central Ohio and beyond. From panels to keynote speakers, our programming is designed to target a diverse audience.

During the 2019-20 academic year, we hosted two diverse panels of academics and practitioners called "Urban Air Quality: A Global Health Crisis" and "Food Security & Healthy Communities." The air quality event brought together experts and researchers in the field of environmental science, natural resources, public health, and the real-world expertise of city and state officials to discuss how air quality affects everyone. The food security event brought experts in the field of planning and food systems to discuss the needs of food security in our communities. These events exemplified CURA's mission to bridge academia and community.













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COFFEE WITH CURA

SPEAKER SERIES

CURA has a long tradition of bringing novel ideas and thoughtful discussion about urban and regional issues to Central Ohio through our semiannual speaker series. Our guest speakers include worldrenowned academic researchers, top-level practitioners, local policy makers and community members, Central Ohio government and our very own Ohio State representatives. Each spring and fall we typically offer one panel discussion, one academic lecture and one practitioner quest speaker.

GIS DAY

GIS Day at Ohio State is an annual event for students, staff, faculty and visitors to learn more about geographic information systems (GIS) and celebrate the power of geospatial analysis and visualization in answering research questions and solving real-world problems. CURA typically partners with University Libraries and Ohio State's Facilities Information Technology Services to host this annual event.

WORKSHOPS

CURA partners with University Libraries to offer GIS workshops tailored toward individuals who would like to use GIS in their research but are unfamiliar with the software. Some workshops we have offered in the past include: GIS for the Rest of Us, Basics of Web Mapping using ArcGIS Online, and GIS and Mapping at Ohio State: Is there an App for that? We usually offer these workshops every spring and fall semester. This year, due to the coronavirus, we started putting together online GIS-related workshops that you can do on your own, at your own pace. Currently we are offering the Using ArcGIS StoryMaps In Your Research and Teaching workshop totally online.

LEARNING OPPORTUNITY HIGHLIGHT ARCGIS ONLINE CHALLENGE (LEARNING PATH)

CURA and University Libraries had big outreach plans for the summer of 2020, but these plans, like so many others, needed to change as a result of COVID-19. We were planning to host a more intensive "GIS Bootcamp" that would have built on many of the introductory workshops we have collaboratively offered in past semesters. But with the bootcamp no longer a possibility, we decided to turn our attention to developing an asynchronous learning experience that could help Ohio State researchers and instructors get a crash course in ArcGIS Online while working remotely. The ArcGIS Online Challenge is a selfpaced, asynchronous, 100% online learning path that was designed to be completed over the course of five weeks, with 2-3 hours of work per week. Each weekly module consisted of a mix of "lecture" content (i.e., blog posts or videos highlighting key concepts and use cases) and a "lab" exercise, where the participants got some hands-on experience with the methods and tools covered in each module. Each week during the challenge, participants got an email with information about that week's topic and content, along with instructions for completing the associated activities. There was no deadline for completing these modules, and our summer challenge included approximately 120 participants..

Our goal with this learning path was to provide an introductory overview of GIS and to increase awareness of potential applications of geospatial methods and technologies among a broad audience of researchers and instructors across Ohio State. We viewed this as a first step toward learning more about GIS and toward engaging with us for more targeted support as participants sought to apply what they'd learned in the challenge to their own research and teaching.

While the ArcGIS Online Challenge website is available for use at any time, the high level of interest in our summer "cohort" offering has inspired us to offer around round in fall 2020.

Below is a description for the challenge:

Have you come across an interactive map on the web and wondered "how did they make that?" Have you heard about GIS (geographic information systems) and wished you could learn more about how it might be useful for your own research and/or teaching? If you answered "yes" to either of these questions, then the Autumn ArcGIS Online Challenge is for you! Through completing this challenge, you will:

- Describe the potential of GIS beyond "dots on a map" and for cross-disciplinary applications;
- Use ArcGIS Online apps individually and in conjunction with one another for common tasks in geospatial projects
- Develop an outline for using GIS in a research project or teaching assignment relevant to your own work

This online learning path is offered through a collaboration between the Center for Urban and Regional Analysis and the University Libraries and was created by Josh Sadvari, Geospatial Information Librarian and Katie Phillips, Outreach Coordinator.

To view or take this challenge go to: go.osu.edu/agol-challenge.



EVENTS -----





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JULY 15-17, 2019 —	New Mobility and Cities Workshop – NSF funded CURA, STEAM Factory, Sustainability Institute
AUGUST 2, 2019 —	Tabling at the Ohio State Fair CURA
SEPTEMBER 5, 2019 —	Coffee w/ CURA: A GIS discussion open to the public <i>CURA</i>
SEPTEMBER 6, 2019 —	Panel Discussion: Urban Air Quality <i>CURA</i>
SEPTEMBER 9, 2019 —	Class Presentation: Anthropology GIS CURA, University Libraries
TEMBER 23-25, 2019 —	Ohio GIS Conference OGRIP, County Engineers Association of Ohio, URISA Ohio Chapter, CURA presented
OCTOBER 4, 2019 —	CURA Speaker Series: Dr. Michelle Bell, Air Pollution and Human Health Future: Emerging Planning Issues; <i>CURA</i>
OCTOBER 8, 2019 —	Workshop: Web Mapping Basics with ArcGIS Online CURA, University Libraries
OCTOBER 10, 2019 —	Coffee w/ CURA A GIS discussion open to the public CURA
NOVEMBER 5, 2019 —	Workshop: GIS and Spatial Analysis at Ohio State: Is there an App for That? <i>CURA, University Libraries</i>
NOVEMBER 7, 2019 —	Coffee w/ CURA: A GIS discussion open to the public CURA
OVEMBER 13 2019	GIS Day 2019

CURA, Geography Department, Enterprise GIS, University Libraries



EVENTS CONTINUED ON NEXT PAGE











NOVEMBER 15, 2019	CURA Speaker Series: Dr. Noreen McDonald, Healthcare Transportation Services <i>CURA</i>
JANUARY 24, 2020 —	Panel Discussion: Food Security and Healthy Communities CURA
JANUARY 28, 2020 —	Think Beyond Summit – Urban Universities + Thriving Communities OSU 150
JANUARY 30, 2020 —	Workshop: Introduction to Web Mapping with ArcGIS Online <i>CURA, University Libraries</i>
FEBRUARY 7, 2020 —	Food Security and Healthy Communities Speaker Series: Dr. Samina Raja, University at Buffalo CURA
=EBRUARY 13, 2020 —	Coffee w/ CURA: A GIS discussion open to the public CURA
EBRUARY 26, 2020 —	Presentation: GIS and Mapping at Ohio State: Is There an App for That? <i>CURA, University Libraries</i>
MARCH 6, 2020 —	Food Security and Healthy Communities: What's Happening in Ohio CURA
MARCH 31, 2020 —	Workshop: Using ArcGIS StoryMaps in Your Research and Teaching <i>CURA, University Libraries</i>
MAY 8, 2020 —	Panel Discussion Webinar: The 2020 Census and COVID-19: Implications for Communities
JUNE 1, 2020 —	Asynchronous Workshop: ArcGIS Online Challenge (Learning Path) CURA, University Libraries
JUNE 12, 2020 —	Panel Discussion Webinar: Economic Impact of COVID-19 on Communities
JULY 31, 20202 —	Panel Discussion Webinar: Social Equity Impact of COVID-19 on Communities
AUGUST 14, 2020 —	Panel Discussion Webinar: Impact of COVID-19 on Mobility in Central Ohio

EVENTS CONTINUED...

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COLLABORATION AND NETWORKING HIGHLIGHT NEW MOBILITY AND CITIES WORKSHOP

Last summer, CURA along with the STEAM Factory, the Sustainability Institute and Portland State University hosted a National Science Foundation-sponsored workshop on New Mobility Technologies, Cities and Data at the STEAM Factory space in Franklinton, a neighborhood in Columbus, OH. The two-day workshop focused on exploring a research network of urban sustainability observatories through data-enabled university-community partnership.

Workshop participants explored how to leverage data from smart city and other technologies to create urban data observatories that can track community progress toward environmental sustainability and social equity and cultivate an innovative ecosystem for new mobility technologies that foster these goals. Participants also discussed how to use urban observatories to enable new forms of sustainable urban system science and policy that involves universities, community stakeholders and citizens as partners.



More than 60 people participated, including Ohio State and Portland State faculty and staff as well as community stakeholders from the public and private sectors in both cities. Local participants include the Mid-Ohio Regional Planning Commission, Smart Columbus, Central Ohio Transit Authority, the Columbus Foundation, EmpowerBus and Honda. Portland participants included members of the city's Department of Transportation, Portland TriMet and SmartPDX. Also represented were speakers and participants from the University of Minnesota, Rutgers University, the U.S. Forest Service and the Urban Sustainability Directors Network. Columbus City Council President Shannon Hardin inspired the participants with opening remarks about the city's mission to improve social equity using innovative mobility.

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OUTREACH HIGHLIGHT FOOD SECURITY AND HEALTHY COMMUNITIES: WHAT'S HAPPENING IN OHIO PANEL DISCUSSION

During the 2020 spring academic semester, CURA focused its events around the theme of Food Security & Healthy Communities. Nearly 11% of the world's population is food insecure or malnourished, and it may get worse: By 2050 farmers will need to produce almost 60% more food than currently. In Franklin County, Ohio, food insecurity is affecting Columbus neighborhoods disproportionately. The type of food that is available to residents in these neighborhoods also plays into food insecurity. People who live in areas that do not have easy access to supermarkets tend to rely on stores that sell nutritionally-deficient or more expensive food. Transportation services, sidewalks and the availability of crosswalks are also variables in residents' access to healthy food options.

CURA hosted panel discussions with local community members from Central Ohio, Dr. Samina Raja of University at Buffalo, and experts from other communities in Ohio. CURA also hosted experts from Cleveland, Dayton and Cincinnati areas who made up our What's Happening in Ohio panel discussion. These experts included:

Marc White, one of the co-founders and farm operations manager from Rid-All Green Partnership, a local non-profit from the Kinsman neighborhood of Cleveland. Rid-All Green Partnership is an urban farm that educates people living in the area about growing local, healthy food.

• White's presentation was about how Rid-All Green Partnership brings urban farming education and training to the Kinsman community. They have several greenhouses, hoop houses and an aquaponics fishery on site.

Michaela Oldfield, Director of the Greater Cincinnati Regional Food Policy Council, which is part of the Green Umbrella Regional Sustainability Alliance (GURSA). GURSA serves as the backbone organization for collective and collaborative impact on creating resilient, sustainable region solutions for all.

• Oldfield's work at GURSA is within a 10-county area, and its goal is to be the convener of collaboration on food policy and environmental change. Their current projects include healthy soils, farm to school, healthy eating and healthcare and zero food to landfills.

Nicole Wasmuth, AmeriCorps VISTA and registered nurse of Hall Hunger Initiative in Dayton. Hall Hunger Initiative works with the Dayton community partners to create a sustainable and just food system in the Miami Valley area of Ohio.

 Nicole's presentation showed the link between the health system and food system in America and ways to improve upon it.

Alan Wight, a faculty member at Christ College of Nursing and Health Sciences and the University of Cincinnati.

• Alan gave a presentation on the food mapping efforts they are involved in in the Cincinnati community. The maps integrate the beauty of art with the sophistication of geographic science to help people in the Cincinnati community understand where they can find local urban farms and edible food.



PEOPLE



HARVEY MILLER

Director

- Areas of Interest:
- GIScience

Education:

Harvey Miller earned his PhD in geography at Ohio State in 1991, returning in 2013 as the Bob and Mary Reusche Chair in Geographic Information Science in the Department of Geography. He is also a courtesy professor in the Department of City and Regional Planning, a member of the Faculty Advisory Board of the Sustainability Institute and an affiliated faculty of the Translational Data Analytics Institute at Ohio State. His research interests include GIS, sustainable transportation, livable cities, and the relationships between human mobility, health and social equity.

Miller also chairs the Mapping Science Committee of the U.S. National Academies. In 2015, he received the Research Award for his scholarly contributions to GIScience from the University Consortium for Geographic Information Science. Learn more about Director Miller's personal research interests on his blog: u.osu.edu/miller.81.

NINGCHUAN XIAO Associate Director

Areas of Expertise:

- Cartography
- Web-based GIS

Education:

Ningchuan Xiao has a broad range of research interests in geographic information science. His main research areas include spatial optimization, spatial and temporal data analysis, information visualization and cartography, GIS development and human and environmental modeling.





 Mobility Analytics • Sustainable Transportation

• 1991 – PhD Geography, The Ohio State University

- 1987 MA Geography, Kent State University
- 1985 BA, Honors Geography, Kent State University

 Spatial Decision Support Systems • Environmental and Ecological Modeling



• 2003 – PhD Geography, The University of Iowa • 1999 – MS Geography, Southern Illinois University • 1995 – MS Geography, Peking University • 1990 – BS Geography, Hunan Normal University



ADAM PORR, Consultation Manager

Areas of Expertise:

- Geographic Information Systems (GIS)
- Project Management
- City and Regional Planning

Education:

- 2019 Master of City and Regional Planning
- 2013 MS Electrical and Computer Engineering, The Ohio State University
- 2006 BS Electrical and Computer Engineering, The Ohio State University

Adam has 10 years of experience as an electrical engineer, manufacturing engineer, and project manager working on electromechanical systems for the defense, science, and healthcare industries. He also has significant experience in Linux systems administration and software development. More recently his efforts have been focused on geographic information science (GIS) and spatial analysis, particularly in the context of spatial multi-criteria decision models. In his role at CURA, Adam leads teams of graduate and undergraduate student workers to produce critical information, analyses, and tools that help university and community partners tackle the urban and regional challenges facing central Ohio.

KATIE PHILLIPS, Outreach Coordinator

Areas of Expertise:

- Geographic Information Systems (GIS)
- Outreach and Education
- Environmental Science and Geology

Education:

- MPAL, Public Administration and Leadership, The Ohio State University expected araduation 2022
- 2013 MS Geology, Bowling Green State University
- 2011 BS Geology, Ashland University

While at Bowling Green State University, Katie's studies were focused on environmental science and climate change. She has five years of experience in GIS, environmental science, education and outreach, and natural resources. Katie has experience building partnerships with municipal entities and other organizations. In her role as CURA's outreach coordinator, Katie builds relationships with students, instructors, researchers, planners, policy makers, and other people interested in urban issues and data science. By investing the time to understand the problems our partners are trying to solve, Katie can offer expert recommendations on how CURA can help solve those problems. Katie also manages CURA's guest speaker series and other events and serves as the voice of CURA for our email newsletter and social media outlets.

SUZANNE MIKOS, Department Manager

Areas of Expertise:

- Budget Forecasting/Finance Management
- Operations Management
- Strategic Planning

Education:

- 2014 MPA Public Administration and Finance. The Ohio State University
- 2007 BA Political Science, The Ohio State University
- 2001 BA Criminology, International Studies, and Russian, The Ohio State University

As the department manager for geography, Suzanne also works closely with the CURA director to establish the organization's budget and conduct hiring for the center. She also supports the outreach coordinator with purchasing and organizational development.

STAFF





VARUN RANGANATHAN DHANVANTH

MS student Computer Science, College of Engineering



JINHYUNG LEE PhD student Geography, College of Arts and Sciences



JIALIN LI PhD student Geography, College of Arts and Sciences







YONGKANG JING

CHUNYU LIU

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GRADUATE STUDENTS



YUCHEN LI PhD student Geography, College of Arts and Sciences



LUYU LIU PhD student Geography, College of Arts and Sciences



KAUSHIK MANI MS student Computer Science, College of Engineering



SIDDHARTH MATHIAZHAGAN MS student Computer Science, College of Engineering

UNDERGRADUATE STUDENTS



NICOLE STEPHAN



RUIYU TAN

GRADUATE STUDENT PROFILE HIGHLIGHT

JIALIN LI

Education:

• PhD Student, Geography

Research Interests:

Jialin's research is on the application of AI and machine learning techniques to understand and generate map images. For map understanding, he applies deep learning methods to detecting map elements (e.g., map title and legend) of choropleth maps and extract information from map elements. For example, if a choropleth map about obesity rate of the United States is given, we can know the map is about obesity rate in the U.S. from its title or legend heading, and the obesity rate value and corresponding representing color can be found for each category in the legend. Besides understanding maps, machine learning methods will also be used to generate map images in his research. In CURA, he is working on the sustainability dashboard project for MORPC (Mid-Ohio Regional Planning Commission). The dashboard aims to present the progress of regional sustainability in Mid-Ohio. He is mainly responsible for the frontend of the dashboard web application.

"Working in CURA is definitely an exciting experience. First, the projects at CURA

are very practical. We would like to solve the real problems together with local organizations. I feel very satisfied when I know that our outcomes are useful and helpful for the local people. Second, throughout the projects, we also conduct related researches, e.g., in cartography, geovisualization and urban study. Last but not the least, our team members are very nice to work with. As a graduate student, sometimes I have urgent academic study tasks and cannot finish my work on time. In those cases, our project manager and outreach coordinator will help me with the issues and give me lots of flexibility on the work."

GRADUATE STUDENT PROFILE HIGHLIGHT

SIDDHARTH MATHIAZHAGAN

Education:

• MS Student, Computer Science

Research Interests:

I came to Ohio State in August 2018 from India to pursue my Masters in Computer Science. It has been a wonderful experience having had the opportunity to meet and learn from some of the best at Ohio State. At CURA, I have worked along with Yongkong in the development of the Campus Sustainability Map and worked on the development of an upload tool for the FOCAL map application to facilitate easier upload and validation of data.

"The team at CURA is always encouraging and gives us the flexibility to work the way we like. This helps in bringing out the productivity and also coming up with innovative solutions to the challenging projects."

PUBLICATIONS AND RESEARCH

Publications by CURA's faculty, staff and students during 2019 -2020.

1. Mahmoudi, M., Song, Y., Miller, H.J. and Zhou, X. (2019) "Accessibility with time and resource constraints: Computing hyper-prisms for sustainable transportation planning," Computers, Environment and Urban Systems, 73, 171-183.

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COVID-19 RESEARCH

The COVID-19 pandemic is an unprecedented event in recent human history. It is almost exactly a century since the world has seen a global pandemic at this scale. Many locales in the United States mandated "shelter in place" orders, with exceptions for essential businesses, such as healthcare, public health, and public safety. This has dramatically altered the dynamics of our cities and regions.

CURA researchers are studying the impacts of COVID-19 on mobility to understand urban dynamics and help plan for more resilient urban systems. For example, CURA researchers compared traffic data for March-April 2019 versus the same period in 2020 in Ohio's three major cities (Cleveland, Columbus, and Cincinnati). They found that lower traffic during the pandemic has led to more extreme speeding. This research, published in the journal Transportation Findings, was covered by local, state, national and international news media. CURA researchers are also studying the decline in public transit demands at a national scale, discovering dramatic changes that reflect the social and economic dimensions of transit dependency in US communities. A third project examines the changes in travel flows in Columbus, showing how urban mobility changes and localizes during a pandemic.

INCREASED SPEEDING AROUND COLUMBUS



BEFORE (2019)



AFTER (2020)

COVID-19 HIGHLIGHT LESS TRAFFIC MEANS MORE OHIOANS ARE PUSHING THE GAS PEDAL: PANDEMIC HAS LED TO MORE EXTREME SPEEDING, ANALYSIS SHOWS

From **news.osu.edu**

Ohio drivers encountering fewer vehicles on the roads during the COVID-19 pandemic are responding by driving faster, a new Ohio State University analysis finds.

Researchers at Ohio State's Center for Urban and Regional Analysis (CURA) compared traffic data in Columbus, Cleveland and Cincinnati from March 28 to April 19 last year with the same time period this year, when people were staying home because of the pandemic. Ohio's stay-at-home order went into effect on March 23.

Results showed that in all three cities, the average level of speeding was up slightly, but "the levels of extreme speeding have increased dramatically," said Harvey Miller, professor of geography at Ohio State and director of CURA.

"The lack of traffic has really released the desire that some people feel to drive fast."

Miller and his colleagues used information from INRIX, a private transportation data company, showing speeds on various segments of major roads and highways in the three cities.

For each road segment, INRIX calculates a reference speed, which is the average speed for that segment when there is no major traffic. It is normally close to the speed limit.

Comparing 2020 to pre-pandemic 2019, the number of road segments showing speeding by drivers has more than tripled in Columbus (from 18 percent to 57 percent) and more than doubled in Cleveland (20 percent to 54 percent) and Cincinnati (18 percent to 48 percent).

In all three cities, the average level of speeding above the reference speed since the pandemic began is between 2.1 mph and 2.6 mph, compared to a year ago when the average was 0.8 mph to 1 mph.

But some areas are much higher. Miller points to a section of I-270 on the west side of Columbus, where speeding has averaged 7 to 28 mph above the reference speed during the pandemic. Similar areas exist in Cleveland and Cincinnati.

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Overall, in 2019, nearly all the road segments that showed speeding were recording speeds at only a few miles per hour above normal. But in 2020, many more road segments showed much higher levels of speeding, the analysis showed.

"There are stretches of road where people are really opening up," he said. "The average level of speeding is not very high. But the extremes have gone up quite a bit."

These findings in Ohio mirror reports from other areas, Miller said. For example, speeding tickets in New York City have doubled, even as traffic is down. In Minnesota, traffic deaths have actually increased, despite the lower vehicle volume.

"The message is that less traffic doesn't necessarily mean our streets are safer. In some ways, they may be more hazardous because we're seeing more dangerous speeding," Miller said.

The threats posed by speeding don't apply just to pandemic times, he said.

"If there is one thing I would do to improve safety in our communities, it would be to reduce speed on our highways, roads and streets. Speed kills."

Co-authors with Miller on the analysis were Jinhyung Lee, a doctoral student in geography at Ohio State, and Adam Porr, GIS project manager for CURA.



"For some people, this is a chance to live some kind of sports car fantasy or live some kind of racing fantasy. It's not a fantasy people should be living. It's very dangerous. Speeding kills, literally."

- HARVEY MILLER -

Miller was also featured on the Cleveland news for the speeding analysis research. To view the segment, visit: **go.osu.edu/news5-speeding**.

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