

# Urban Tech Hub

Annual Report 2022

*Leveraging the power of technology to make cities stronger, fairer, and more resilient.*

JACOBS  
INSTITUTE

AT  
CORNELL  
TECH



It has been an  
extraordinary year  
here at the Jacobs  
Urban Tech Hub.



From hosting our first Urban Tech Summit in the fall and the completion of our landmark *Rebooting NYC* report in the winter, to graduating our pioneering first cohort of 15 Urban Tech Master's Students in May, we have strengthened each of the three pillars of our mission of exemplary **education**, cutting-edge **research** and dynamic ecosystem **engagement**.

Despite the challenges of the COVID pandemic, we hosted a hybrid in-person/online Urban Tech Summit last fall. The event brought together 1300 people from government, industry and academia to Cornell Tech's new Verizon Executive Education Center. The event focused on two recent Hub research initiatives, Anthony Townsend's Horizon Scan and Rit Aggarwala's *Rebooting NYC* report.

We issued the final draft of *Rebooting* in January 2022 and are thrilled that Mayor Adams's administration has embraced many of the policy recommendations from the report, including integration of the city's tech services under a single senior administration official,

the creation of a "digital wallet" for public benefits, and the increased use of cameras for traffic enforcement.

The new Adams administration also adopted one of the Hub's most significant assets. In February our Senior Urban Tech Fellow Rit Aggarwala was appointed to be the city's Commissioner of the Department of Environmental Protection and Chief Climate Officer, helping to strengthen the Hub's connection to city government.

The Hub's engagement with the city's tech industry also expanded this past year. We co-sponsored, along with Tech:NYC and Google for Startups, the first NYC Recovery Challenge. This Challenge attracted 175 submissions from all five boroughs to compete for \$165,000 in prize money for NYC-based companies developing new technologies to support more resilient job growth in the city.

Finally, as we look forward to our third year, we are proud to release our latest initiative, a first-of-its-kind analysis of the city's urban tech ecosystem,

*The Urban Tech Mosaic: The Systems Powering the Next New York*. This study reveals the impact of the urban tech industry in New York City, highlighting the over 500 companies, 44,000 employees and \$17 billion in investment to date.

As the city faces the challenges of COVID recovery, climate change and increasing inequality, urban technology has never been more central in helping our city address these and other challenges. We continue to be optimistic for the future of New York City, and look forward to supporting the city's efforts to recover, renew and strengthen our position as the center of urban technology innovation.



**Michael Samuelian**  
Founding Director,  
Jacobs Urban Tech Hub



# JACOBS TECHNION-CORNELL INSTITUTE

AT CORNELL TECH

Despite the challenges of the pandemic, the Jacobs Technion-Cornell Institute's radical approach to experimentation has never been more important. Building on the strength of our existing Health Tech and Connective Media Hubs, the Urban Tech Hub is our latest effort to increase our public engagement and academic excellence.

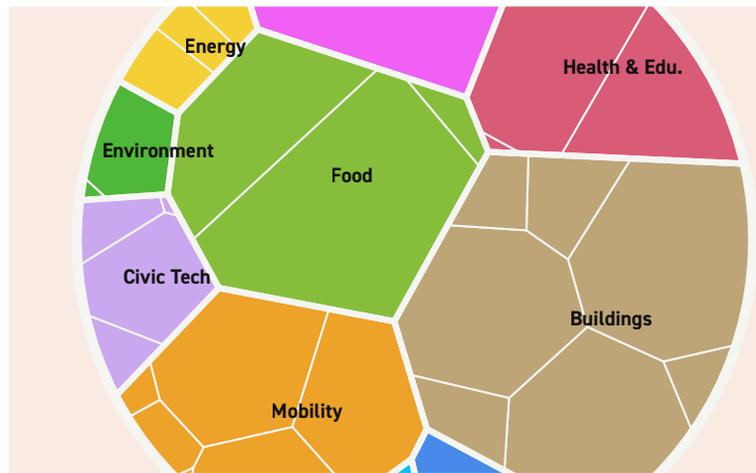
I am thrilled that we were able to safely restart our "iTrek" program with the Technion this past year. In March we brought 27 Cornell Tech and Jacobs students to Israel, where they worked alongside Technion students in Haifa to jointly develop solutions to health tech challenges posed by leading Israeli medical institutions. These experiences of cross-fertilization are crucial to strengthening our relationship with Technion students and faculty.

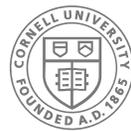
In addition to our three Hubs, our Runway and Spinouts programs continue to support and build companies that address pressing tech challenges. To date we've spun out more than 89 new companies, and these companies are having a significant impact on the city's tech ecosystem, employing more than 400 technologists here in the city. I am proud that 94.4% of our home-grown companies remain in NYC, and continue to contribute to building and strengthening our city's tech engine of innovation and growth.

We look forward to continuing to expand our impact across New York City and around the world with the Jacobs Urban Tech Hub helping lead the way.



**Ron Brachman**  
Director, Jacobs Technion-Cornell Institute

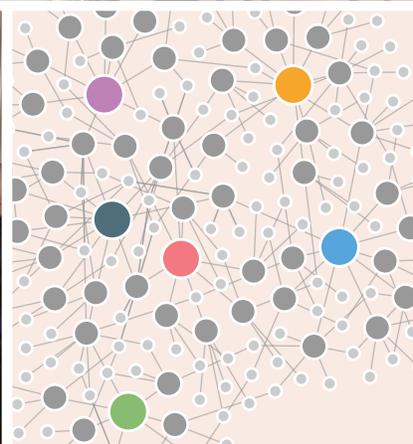




# CORNELL TECH



I was inspired standing alongside Mayors Adams and Bloomberg on campus at the celebration of our 10th anniversary. It was an incredible moment for us to reflect on the foresight and bold vision that created our campus and the incredible impact that we are having on the city. We've graduated over 1200 students, attracted top-tier faculty to New York City, and continued to push the envelope on technological innovation through our research.



In addition to the important work that the Urban Tech Hub is undertaking with city agencies, industries and communities, our impact is being felt in other ways across the city. Our K-12 initiative has trained more than 5,000 public school teachers on how to better integrate computer science education into their curriculum. Our Break Through Tech program is reducing the gap in gender equity in technology through innovative programs. Thanks to this initiative, for example, CUNY women declaring computer science and related disciplines as their major increased 61.5%.

While our public engagement is an important part of our impact, education is core to our mission. We graduated our largest class of students this past May who went off into New York's tech ecosystem to work for large, established companies like Amazon and Google, but many also started their own ventures, building on the entrepreneurial spirit that is at the core of Cornell Tech's mission. New and exciting companies like Canary Privacy, which helps businesses test, monitor, and fix privacy issues on their websites and apps to protect user data and ensure compliance, are today being incubated here on Roosevelt Island.



Our first ten years have been an amazing journey, and we look forward to continuing to expand our mission and impact on the city, advance cutting-edge research into the positive impacts that technology can have on society and build a new generation of home-grown tech talent for New York.

**Greg Morrisett**  
Jack and Rilla Neafsey Dean  
and Vice Provost, Cornell Tech





# Research

One of the main pillars of the Urban Tech Hub's mission is to expand and share knowledge through applied research in cities. We focus on undertaking original research that helps cities utilize digital tech to optimize urban systems while increasing equity and access to new technologies.

The Hub's research interests are broad, from the tactical understanding of how local governments can deploy new technologies to the long view of how the cities of the future will adapt and change as a result of the rapid adoption of new digital technologies.

Our technical research is on the cutting edge of digital innovation, looking at how sensors can enable better asthma diagnostics to soil quality for urban agriculture. Data science is at the core of many of our initiatives, specifically how open source data can both optimize how city agencies manage their workflow to how cities around the world can share best practices with regard to open source software.

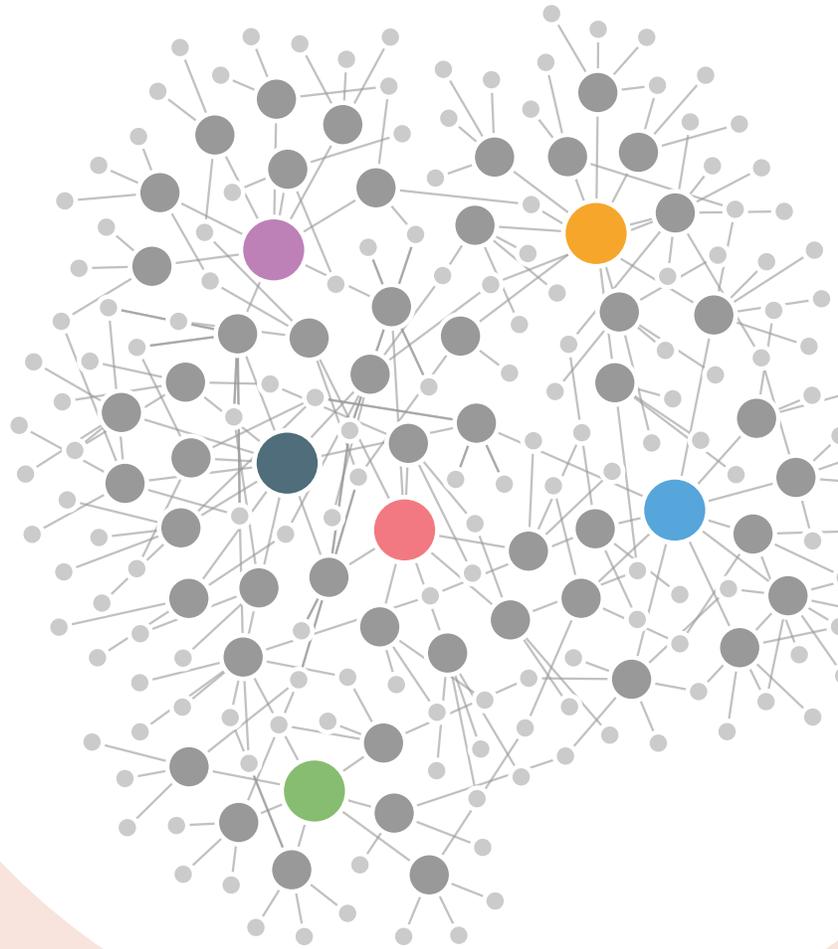
# The Future

## Mapping the Future of Urban Tech

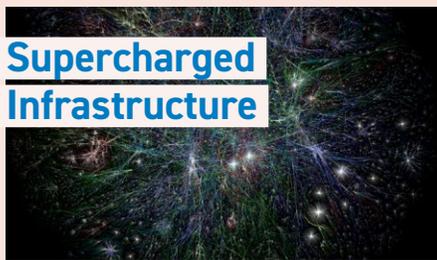
Anthony Townsend

Self-repairing roads and sewers. Forests and farms inside buildings. Software that follows our instructions rather than following us around. These are just some of the possibilities and pitfalls for urban tech in the decade ahead. The Horizon Scan is a map of urban tech's potential, charting the many promising discoveries and inventions of the decade ahead.

In fall 2021, the Hub published "The Future of Urban Tech," a Horizon Scan of what's to come as the intersection between cities and technologies intensifies. Six trends were forecast based on thousands of data sources, highlighting directions in where and how technology and cities are converging, morphing, adapting and evolving together. This project reveals a kaleidoscope of urban futures that explores future breakthroughs, innovations, and applications that will reshape our cities and communities.



The Horizon Scan explores six big stories on the future of urban tech.



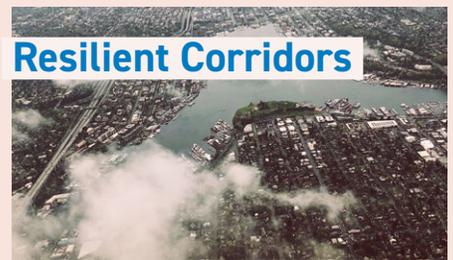
### Supercharged Infrastructure

Urban systems converge into a deep, actionable web.



### Wild & Well

Urban design taps life science to improve well-being.



### Resilient Corridors

Sustainable neighborhoods scale up.



### Dark Plans

The chaos of urban life gives way to an algorithmic hum.



### New Screen Deal

Inclusive innovation strikes back at surveillance capitalism.



### Urban Innovation Industrializes

Big business cracks the code of the city.

Visit [futureofurbantech.org](https://futureofurbantech.org) »

# How Tech Can Help Local Governments

## Rebooting NYC: An Urban Tech Agenda

Rohit T. “Rit” Aggarwala, Michael E. Bloomberg, Victoria M. Woo, Sarah Goodyear, Rebecca Lassman, Adrian Silver, Phillip D. Ellison, Matt Stempeck, Conor Lyman, Preksha Agarwal, Andrew Salzberg, Linda Jaber, Ben Oldenburg, Michael M. Samuelian

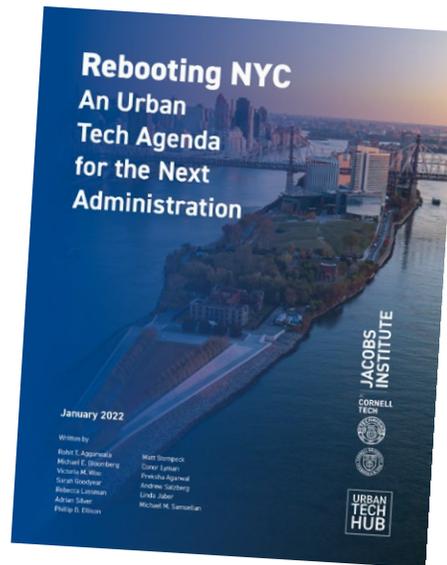
In January 2022, after a year of effort, the Hub released the final *Rebooting NYC* report, which proposed new and existing urban tech solutions to some of New York City’s biggest challenges. This research helped shine a light on how tech can help the city run better while increasing access and equity through the responsible use of new digital technologies.

After releasing a first draft of the report in May of 2021, the Urban Tech Hub consulted with hundreds of tech, civic and community leaders, including current and former city council members and state senators, other elected officials, local Business Improvement Districts and Chambers of Commerce.

The report was widely hailed for being a proactive blueprint for how technology could be deployed by the next mayoral administration. Many of the recommendations advocated in the report have already been adopted or are actively being considered, including the expanded use of cameras for traffic enforcement, the creation of a digital wallet for public benefits, the study of drones for building inspections and the consolidation of city technology services under one executive management official.

“As New York emerges from the COVID crisis and works to reinvent itself as a more equitable and sustainable city that can continue to lead in the 21st century, it is imperative that its government rethink how it uses technology to serve the public. To meet this goal, Cornell Tech’s *Rebooting NYC* report provides a clear and concise roadmap that can guide the next administration to fundamentally change the way the city works and responds to the challenges and opportunities it faces”

— Andrew Rasiej, CEO, Civic Hall



In January, Rit Aggarwala, the Hub’s Senior Fellow and principal author of the *Rebooting* report was appointed by Mayor Adams to be the city’s Commissioner of NYC Department of Environmental Protection (NYC DEP) and the city’s Chief Climate Officer.

### Key observations shaped the report

**Foundations:** Urban tech progress requires reassuring the public on privacy and developing greater capacity to implement tech solutions

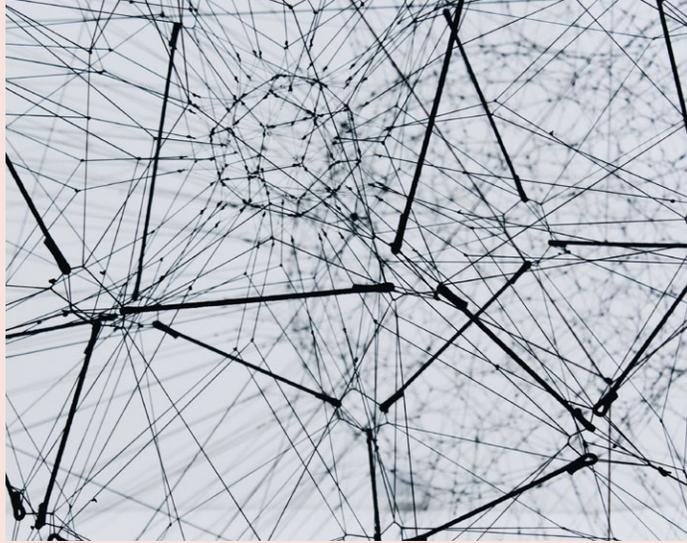
**Equity:** Ensuring all New Yorkers can participate in the digital economy is a prerequisite for the City to rely more on what tech offers

**Systems:** Many City services and functions can be improved with technology

**Engagement:** A key area where the City can make use of technology is in greater public engagement and transparency

**Futureproofing:** The City has failed to get ahead of new technologies; existing institutions are not equipped to forecast how urban tech will evolve

Visit [urban.tech.cornell.edu/rebooting-nyc](https://urban.tech.cornell.edu/rebooting-nyc) »



# The Urban Tech Mosaic: The Systems Powering the Next New York

Michael Samuelian, Anthony Townsend, Nneka Sobers, Preksha Agarwal, Max Dumas, William Hong, Eesha Khanna, Jenny Liu, Lars Kouwenhoven, Harrison Yu

## How Cities Make Software Together

Anthony Townsend, Nneka Sobers

Generously Supported by the Alfred P. Sloan Foundation, Ford Foundation, Mozilla Foundation, Omidyar Foundation, and Open Society Foundations

Municipal governments are riding a wave of volatile economic, ecological, and social change. One constant, however, is the accelerating spread of digital technologies. Even as cities rely more on software to function, they struggle to obtain and maintain this software. How can cities effectively collaborate and share knowledge/resources to spark, scale, and sustain digital technologies?

Researchers from the Urban Tech Hub have developed a new framework, "orchestrated development" which introduces new practices for developing efficient municipal technology. This research explores six case studies of novel ways governments, non-profits, and open source advocates can leverage their unique strengths and resources to build robust municipal technology processes.

Ultimately, the goal of the project is to develop a toolkit that will help municipal governments evaluate the potential of Open Source Software (OSS) development, the identification of best practices and whether these resources should be developed internally or outsourced to third parties.

### Case Studies

**CitySDK (City Service Development Kit):** European Union

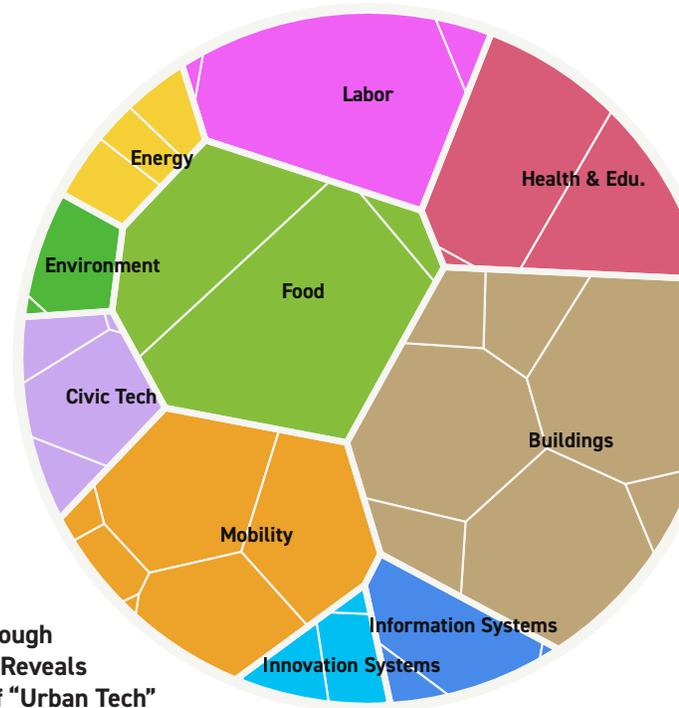
**Foundation for Public Code:** Netherlands

**LocalGov Drupal:** United Kingdom

**Open Plans x TriMet:** United States

**OS2:** Denmark

**Nordic Institute for Interoperability Solutions (NIIS):** Estonia



### Breakthrough Analysis Reveals Impact of "Urban Tech" on New York City's Economy

What if buses were smaller and smarter and came at the click of a button, like an Uber? What if buildings knew when employees were working from home and turned off office lights and air-conditioners to reduce energy waste? These are just two of the ideas driving growth in "urban tech," a new slice of New York City's tech sector focused on solving urban challenges that's providing the ideas and tools for rewiring the post-pandemic city and contributing to its economic recovery.

The pandemic was a surprising catalyst for urban tech innovation in New York City. At first, tech was viewed as a city-killer, offering remote replacements for work, learning, health, entertainment, and education as buildings emptied out and commuters abandoned public transit. But more than three dozen new urban tech enterprises have started up since the start of 2020. Among the many innovations they are pioneering are solutions that make the recovery from the pandemic safer, smarter, and easier for people and businesses alike.

The findings of this interactive analysis published by the Urban Tech Hub reveal that the more than 500 urban tech enterprises headquartered in New York City have created over 44,000 jobs, and raised more than \$17.4 billion over the last decade. Urban tech now rivals established clusters like life sciences as a source of jobs in the city's continuing tech renaissance.

Visit [urbantechecosystem.nyc](http://urbantechecosystem.nyc) »

# Applied Urban Technology Research

“Our applied research embraces novel approaches to addressing pressing urban challenges with new digital technologies.”

## Tree Folio NYC: Equitable and Effective Urban Shade



Visit [labs.aap.cornell.edu/daslab/projects/tree-folio-nyc](https://labs.aap.cornell.edu/daslab/projects/tree-folio-nyc) »

**Tree Folio: NYC is a digital simulation of each street tree in New York City and its local shading impact, providing data to study the distribution of street tree benefits and inform more equitable and effective tree planting strategies.**

Street trees are a crucial layer of distributed urban infrastructure that have historically been unevenly distributed, exacerbating the inequities of the city and exposing vulnerable communities to the effects of climate change. Street tree benefits are highly dependent on local contexts, street orientation and neighboring building heights to name a few. Equitably and effectively investing these benefits is crucial to confronting the challenges of climate change and urban heat island effects in cities around the world.

*Tree Folio: NYC* uses high-resolution LiDAR data to construct accurate 3D models of each street tree in NYC and the tree's immediate context. This project models an individual tree's shading impact and current city-wide distribution. In the future, this tool can improve equitable and effective access to shade in the City of New York.

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**Alexander Kobald, Joe Ferdinando.**  
*Collaborators: Jiahao Dong & Sarang Pramode. Advisors: Anthony Townsend, Meejin Yoon (Cornell University AAP).*

## Equity in Resident Crowdsourcing: Measuring Under-reporting without Ground Truth Data

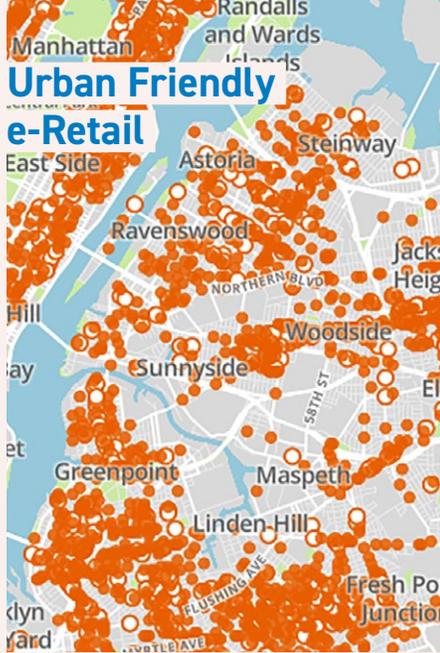


**This project develops computational methods to understand heterogeneous biases and behavior in crowdsourced data, audit government responses to resident complaints and help design more efficient, equitable, implementable decision-making systems.**

Many municipal government services are allocated in reaction to resident crowdsourcing, in which people report problems they encounter; the New York City 311 system received 2.7 million complaints in 2021. These reports are used to make both immediate decisions—such as which dangerous trees to address—and longer-term planning decisions, such as which streets to resurface. While such reporting systems have gained popularity in the last few decades, there is concern that the public doesn't homogeneously use the system and that municipal agencies are not equitably responsive to complaints from different neighborhoods. This project develops computational methods to understand heterogeneous biases and behavior in crowdsourced data, audit government responses to resident complaints, and help design more efficient, equitable, and implementable decision-making systems.

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**Nikhil Garg.** *Collaborators: Zhi Liu, Ben Laufer, Emma Pierson, Emma Condie, Marie Leaf, Elizabeth Pysher, Daan van der Zwaag. NYC Department of Parks and Recreation (City Partner).*



**Developing models and algorithms to efficiently optimize e-retail operations in urban areas.**

The increasing availability of e-retail and the introduction of same-day delivery over the last decade made our lives more convenient in many ways. To accomplish same-day delivery, e-retailers operate warehouses close to urban areas. However, these warehouses have extremely limited capacity, which creates many operational challenges.

In this project, based on our methodological background in optimization and practical background in logistics and supply chain, we develop models to streamline e-retail operations in urban environments including inventory management, assortment personalization and facility location. We also investigate the problem of using existing brick-and-mortar stores as additional warehouse space to make e-retail and online groceries more widely available. This can help alleviate food deserts and allow households to access a wider assortment of products, and consequently, develop a symbiotic relationship between e-retailers, local businesses, and communities.

*Omar El Housni, Huseyin Topaloglu. Collaborators: Sean Michael Xiao Yang, Yang Song.*



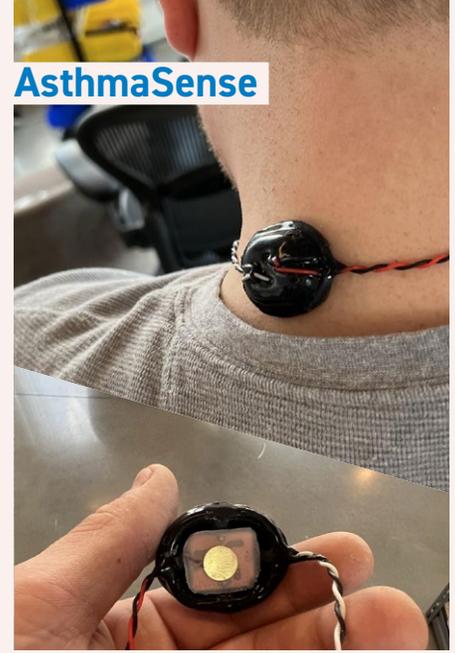
**Using Sensing and VR Technologies to Support Urban Farming**

**Using wireless sensing and virtual reality (VR) technologies to address urban farming across New York City and developing a novel inexpensive and low-power Radio Frequency (RF)-based wireless sensor that can determine soil metal concentration in large areas without land disturbance.**

Urban agriculture has the potential to help meet the growing demands for locally produced, low-carbon-footprint, affordable produce for urban residents. However, there are numerous obstacles that urban farmers face. These include dealing with degraded or contaminated soils, lack of land access and lack of awareness and social networking opportunities with other farmers. This project addresses these challenges, by creating a set of tools for participatory sensing in urban agriculture, and a virtual reality (VR) platform for sharing data.

This project is also developing a low-cost sensor that can map the soil metal concentration across different communities and assist them in remedial actions, with a model for participatory research and remediation that can be shared with environmental justice communities worldwide.

*Rajalakshmi Nandakumar, Tap Parikh, Noah Snavelly.*



**AsthmaSense**

**AsthmaSense is a low-cost, wearable, multi-modal sensing system for reducing asthma-related emergencies by detecting/predicting the onset of asthmatic attacks in pediatric patients.**

The AsthmaSense project is focused on measuring respiratory sounds and motion to identify early signs of asthmatic attacks in pediatric asthma patients. According to our medical team, these symptoms are not always easily identifiable by the patients until it is too late. By notifying the patient, or a caregiver, we can get them to help before an emergency occurs (even if that simply means alerting them to take their medication). The goal is to reduce emergency room visits or worse outcomes.

This novel device consists of three custom body microphones, an accelerometer, and a Bluetooth-enabled microcontroller. The three microphones capture sounds from the body as it transmits through the sternum and clavicles (this is known as bone conduction). The microphones only capture surface vibration, rejecting any audio in the air.

*Alexander Adams, Rajalakshmi Nandakumar, Lynne Li. Collaborators: Jennie Ono, Stefan Worgall and Rohan Gulati (WCM).*

# Engagement



One of the major pillars of the Urban Tech Hub's mission is to engage the broader NYC Tech Ecosystem. Leveraging the convening power of Cornell University, we bring together diverse voices to address the challenges that cities face today. From hosting on-campus events to strategic partnerships, the Hub works closely with New York's incredible community of tech doers and thinkers from government, academia and industry.

## SCNY Urban Tech Summit 2021

As New York emerged from COVID-19, cities around the world are making a new commitment to building a more inclusive, sustainable future through urban tech. After suspending the Smart Cities New York conference in 2020 due to the pandemic, organizers were excited to return with a three-day convening at the Urban Tech Hub on Roosevelt Island.

Across three days, over 1,300 participants joined both in person and virtually from around the world as thought leaders delved into topics such as climate solutions, infrastructure

planning, reaching climate goals, racial equality in tech, surveillance, safe streets, digital lockers for public benefits, and procurement in the digital age. Each day had its unique focus, but it was clear from the conversations that every sector is tied together and that collaboration is necessary to achieve success. From learning how supply chains are affected by shared streets to the relationship between data, surveillance, and police, the Urban Tech Summit was a comprehensive first step to making cities better.



The SCNY Urban Tech Summit packed 3 days of panels and talks; some select sessions included:

## Days 1 & 2: The Future of Urban Tech

- ▶ Supercharged Infrastructure
- ▶ Resilient Corridors
- ▶ Dark Plans
- ▶ New Screen Deal
- ▶ Urban Living Labs
- ▶ Urban Innovation Industrializes



NYC's tech ecosystem has grown and has become its own virtuous cycle."

— **William Floyd**, Director, Government Affairs & Public Policy, Google | PANEL Resilient Corridors

## Day 3: An Urban Tech Agenda

- ▶ Procurement and Talent in the Digital Age
- ▶ Revealing Injustice
- ▶ Closing the Digital Divide
- ▶ Privacy in the Public Realm
- ▶ Tech for Safe Streets
- ▶ Digital Locker



Cars are penthouse transportation."

— **Shabazz Stuart**, CEO, Oonee | PANEL Tech for Safe, Shared Streets



There is a connection to how access to urban systems — like broadband— may have a huge, direct impact on how people participate in cities."

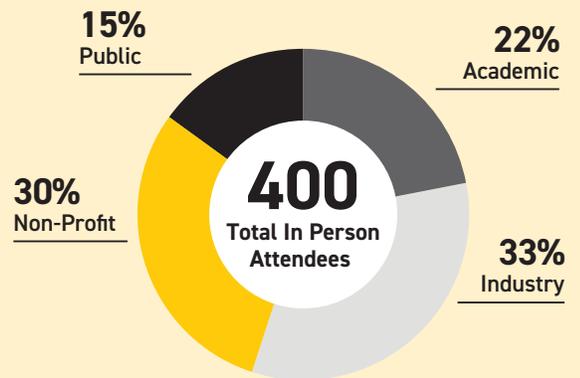
— **Nneka Sobers**, Program Manager, Urban Tech Hub | PANEL Revealing Injustice



Artificial intelligence and IoT (internet of things) are foundational to solving digital problems that city governments face."

— **John Paul Farmer**, Chief Technology Officer, New York City | PANEL Positioning NYC to Anticipate and Shape Urban Tech

## Attendee Metrics



**2,072**  
Total In Person and Virtual Registrations



# Join Us

**October 24-25th: The Urban Tech Summit 2022 edition**

Visit [scnyurbantech.com](https://scnyurbantech.com) »

Over 250 students, civic hackers and advocates packed the Verizon Center to celebrate open data in NYC.



## Open Data Week

The Urban Tech Hub partnered with the NYC Mayor's Office of Data Analytics, BetaNYC, and Data Through Design, to co-host NYC's Open Data Week.

In the first week of March 2022, coders, activists, government officials and hackers gathered online and in person on campus to celebrate NYC Open Data as well as the 10th anniversary of the Open Data Law. The week-long festival of events included School of Data, a day-long civic tech conference and Data Through Design, a data visualization art exhibition.

Open Data Week is an annual festival of community-driven events. Every year, New Yorkers come together across the five boroughs to celebrate New York City's Open Data Law, which was signed into law on March 7, 2012. Coincidentally, the first weekend of March is also International Open Data Day. During this weeklong event, organizers rallied NYC's civic tech and open data communities and offered opportunities for more people to learn about and engage with municipal open data.

## AMbiENTe

In June, the Urban Tech hub co-produced a day-long convening focused on Autonomy and Mobility in Engineered and Environmental Systems (AMbiENTe).

The event was inspired by the fact that sensors and the Internet of Things (IoT) are providing unprecedented opportunities for sampling air quality in urban areas. When combined with recent innovations in artificial intelligence, autonomous vehicles, and electric vehicles, this powerful convergence can inform the design, policies, and management of future smart cities and natural environments.

The AMbiENTe Workshop brought together world leaders in technology and urban planning, mobile sensing, transportation, and smart grids to discuss pressing technical hurdles and opportunities in the development of future integrated engineered and natural environments.

Sponsored by the Jacobs Urban Tech Hub, Cornell Tech, Cornell Engineering, Cornell Energy Systems Institute, Cornell Atkinson Center for Sustainability, Veho Institute for Vehicle Intelligence and the Italian Academic Center, and the Italian Scientists and Scholars in North-America Foundation (ISSNAF).

Keynote speakers at the workshop included John Albertson, professor of civil and environmental engineering; Anna Scaglione, professor of electrical and computer engineering at Cornell Tech; and Carlo Ratti, professor of urban technologies at the Massachusetts Institute of Technology.



“The theme for this workshop is fostering synergies between Ithaca-based faculty and Cornell Tech-based faculty...Topics like smart cities naturally bring together areas such as architecture and engineering, but also computer science and urban technologies in a way that's very powerful and fundamental.”

— **Silvia Ferrari**, John Brancaccio Professor of Mechanical and Aerospace Engineering, who co-organized the AMbiENTe Workshop



The 2021 NYC Recovery Challenge Fellows celebrated the conclusion of the program with the project sponsors from Cornell Tech, Tech:NYC and Google for Startups.

## NYC Recovery Challenge

This challenge began in spring 2021 when three leaders in New York City’s tech ecosystem, Cornell Tech, Tech:NYC and Google for Startups came together with the shared goal of helping New York City’s business recovery. The strategy was to focus on ways that technologies were being used by New York-based tech startups to support small businesses and the workers most directly affected by the COVID-19 pandemic. The *Challenge* was also looking to spur diverse and resilient job growth and retention in the city to address New York’s still high unemployment rate, which was still two times that of the rest of the country.

In December, ten companies were selected out of more than 175 submissions. In addition to \$165,000 in cash prizes to the top four finalists, all ten founders were dubbed “NYC Recovery Challenge Fellows” and enrolled in a mentorship program created by Google for Startups and Cornell Tech. This bespoke eight-week program gave winners three months of equity-free support, including 1) training on product, marketing, sales, fundraising and leadership; 2) access to Google and Cornell Tech’s network of industry experts; and 3) support with company and product strategy.

Like any good educational partnership, the project sponsors learned as much from the diverse cohort as they gained from the curriculum. We learned that technology is helping to empower workers like never before, using new tools such as AI, machine learning and data science to invert traditional power structures that kept many workers from taking full control of their careers. And with the advent of Web 3.0 this devolution of power will only accelerate as users gain more agency in the workplace, empowering workers like never before.

### 2021 Recovery Challenge Fellows

- Kobina Ansah, Coverr** (Queens) — Financial services customized for gig economy workers for highest earning potential.
- Byran Dai & Rahul Mahida, Daivergent** (Manhattan) — A platform that maximizes job-readiness for individuals in the autism and disability population.
- Su Sanni & Chris Coles, Dollaride** (Brooklyn) — A mobility company for communities underserved by public transit.
- Kelly Ifill, Guava** (Manhattan) — Digital community banking for Black-owned small businesses.
- Karen Schoellkopf, Leap Fund** (Brooklyn) — Solutions to identify, bridge, and ultimately, eliminate benefits cliffs creating pathways towards financial independence.
- Jason Greenwald & Daniel Langus, Live XYZ** (Brooklyn) — Map and places directory where every business on every block is mapped to the front door, classified, and updated over time.
- Amina Yamusah, Sector** (The Bronx) — Job application and job tracker that walks upskilled job seekers through an optimized job search.
- Tracey Hobbs, Shifterr** (Brooklyn) — Makes finding work and hiring employees easier and more flexible.
- Tomas Uribe & Kristian Diaz, Mavity** (Manhattan) — End-to-end collaboration tool for creative teams.
- Tanvir Islam, David Jiang and Bassit Malam, TYCA tech.** (Brooklyn) — AI-powered online community marketplace connecting people to local brick & mortar bodegas.

Visit [events.withgoogle.com/nyc-recovery-challenge](https://events.withgoogle.com/nyc-recovery-challenge) »



# Education

*We graduated our first cohort of Master's students who concentrated on Urban Tech. This pioneering group successfully tread the waters of COVID-19 in their first year and graduated to become the latest leaders in the urban tech ecosystem in New York City and beyond.*

## Master of Science in Applied Information Science (Technion) & Master of Science in Information Systems (Cornell) with a Concentration in Urban Tech

The Jacobs Technion-Cornell Dual Master's Degrees in Urban Tech provides students from a variety of undergraduate backgrounds a common view of how cities work and vocabulary for thinking of cities as systems of systems. The Urban Tech program affords students the ability to study, create, and deploy a variety of forms of urban tech, with a focus on using digital-related technology to make cities stronger, fairer and more resilient.

Students design the future of connected, livable, and adaptable cities while living in the heart of the ultimate urban ecosystem: New York City. Courses show students how to apply machine learning, data science, human-computer interaction, and product design to the social, economic and technical challenges of a city in this transformational program.

“Our new graduate program in Urban Tech is the first of its kind in the country.”



Urban Tech students visited the Hudson Yards Cogeneration Plant as part of the Urban Systems course

“Most students quickly found employment in fields ranging from data science to urban mobility.”



## iTrek Returns to Israel!



Due to a brief COVID surge, the 2022 iTrek program was postponed from January to April to align with Cornell Tech's Spring Break. From October through the end of December, 37 Technion, 2 Tel Aviv University, 27 Cornell Tech students, and professional designers teamed together to find solutions to prompts around Climate Change and Health. The teams submitted their preliminary drafts to their sponsors from Ichilov Hospital of Tel Aviv and Rambam Health Care Campus of Haifa. The 27 Cornell Tech students and their Technion and Tel Aviv University counterparts presented their completed solutions to a set of judges in April.

# Urban Tech Courses

## Urban Data

Prof. Emma Pierson

This course empowers students by closing the gap between the data-related questions asked and the ones we have the technical training to answer. The course provides a broad overview of the opportunities and challenges related to urban data and helps familiarize students with key datasets and the tools and methodologies to visualize and analyze them.

## Urban Systems

Michael Samuelian

Urban Systems is the study of the elements or agents that make up a city along with their relationships and connections. This course explores how a city is composed of complex interactions of urban systems, ranging from infrastructure and transportation networks to social, cultural and political systems. Students are introduced to the concept of the city as a “system of systems” and the needs of users operating and interacting within such systems. The course offers broad perspectives on pressing urban challenges such as resiliency, equity and Covid recovery.

## Urban Design

Yaseem Pattie & Steven Stainbrook

What is urban design, and how does it impact innovation? In turn, how can innovation, especially in technology, address urban issues? This course explores urban spaces, both indoors and out, including streetscapes, neighborhoods, co-working facilities, campuses, and labs to understand how they affect the ways that people work, live and play in cities.

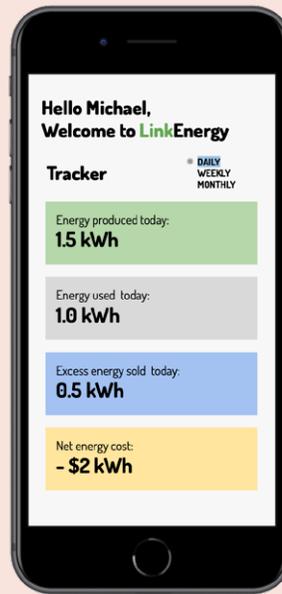
## Smart Cities: Requirements, Ambitions, and Limitations

Anthony Townsend

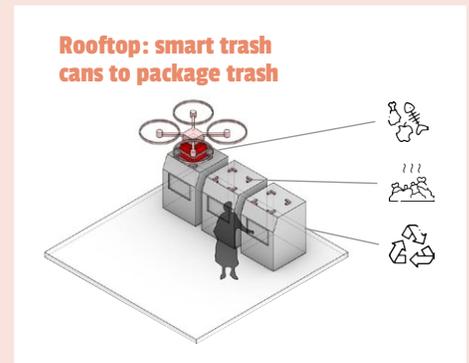
The smart cities movement was born during the Global Financial Crisis of 2007-8, when multinationals slashed spending on IT and governments ramped up stimulus spending. Big vendors like IBM, Cisco, and Siemens seized the opportunity to port enterprise tech to the municipal sector. This course examines the shift from smart cities to urban tech, and the landscape for engineering cyber physical urban systems today.

“The Urban Tech program allowed me to gain a deep understanding of how technology is applied in different processes within NYC and taught me how to fruitfully apply topics from computer science to improve lives in cities.”

— Lars Kouwenhoven, UT'22



Urban Systems Project: Eesha Khanna, Jenny Liu, Panda Xu, Ruoyu Zhou, Sarang Pramode, William Hong



Urban Systems Project: Emma Condie, Marie Demple, Matan Oppenheim, Max Dumas, Yimeng Sun, Yuzhen Zhang



Urban Design Project: Emma Condie, Jenny Liu, Max Dumas

# Who We Are

**Michael Samuelian**  
Founding Director



Michael Samuelian is the Founding Director of the Urban Tech Hub at Cornell Tech. He is an urban planner, real estate developer, professor, and most recently the President and CEO of the Trust for Governors Island. From the revitalization of Lower Manhattan after 9/11 to the creation of a new neighborhood in Hudson Yards and the activation of Governors Island, he's helped plan, design and develop some of the most transformative projects in New York City.

**Rohit "Rit" Aggarwala**  
2021 Senior Urban Tech Fellow



Before joining the Urban Tech Hub as a Senior Fellow, Rit was a member of the team at Sidewalk Labs, an urban innovation firm. He is also the co-chair of the Regional Plan Association's Fourth Regional Plan for the New York metropolitan area and an adjunct professor at Columbia University's School of International and Public Affairs. From 2006 to 2010, Rit served as Director of New York City's Office of Long-Term Planning and Sustainability, which was created to develop *PlaNYC: A Greener, Greater New York*. In January of 2022, Rit left the Urban Tech Hub to lead the NYC Department of Environmental Conservation and take on the role of the city's Chief Climate Officer.

**Nneka Sobers**  
Program Manager



Nneka Sobers is an urban designer and product strategist who strives to help citymakers leverage technology to increase public good. Working at the intersection of urban planning, design research, and civic technology, Nneka takes a systems-level and empathetic approach to developing accessible tools that help connect people to city systems. Prior to joining Cornell Tech, Nneka was a Product Manager at NYC Planning Labs, as well as a co-founder of a civic tech startup that helped low-income communities manage self-organized infrastructure systems powered by a barter-based digital economy.

**Ron Brachman**  
Director of the Jacobs Institute



Ron Brachman is the Director of the Jacobs Technion-Cornell Institute and a Professor of Computer Science at Cornell University. He is responsible for the oversight of all Institute activities and programs, continuing to develop its vision and strategy and grow it into a new role model of innovation for graduate education, while training new leaders who use deep science to change the world. He is the co-author of the recent book *Machines like Us: Toward AI with Common Sense*.

**Anthony Townsend**  
Urbanist-in-Residence



Dr. Anthony Townsend works at the intersection of urbanization and digital technology. He is Urbanist in Residence at Cornell Tech's Jacobs Institute, where his research focuses on scenarios and ethical frameworks for urban tech innovation. Anthony is the author of two books, *Ghost Road: Beyond the Driverless Car* (2020) and *Smart Cities: Big Data, Civic Hackers and the Quest for A New Utopia* (2013), both published by W.W. Norton & Co. His consultancy, Star City Group, works around the world with industry, government, and philanthropy on urban tech foresight, policy, and planning studies.

**Anna Scaglione**  
Director of Urban Tech Master's Program



Anna Scaglione M.Sc.'95, Ph.D. '99 rejoined the faculty of Cornell Engineering in September 2021 as a professor of electrical and computer engineering based at Cornell Tech. Prior to returning to Cornell, she was a Professor of Electrical, Computer and Energy Engineering at Arizona State University. Dr. Scaglione's expertise is in the broad area of statistical signal processing with application to communication networks, electric power systems/intelligent infrastructure and network science.

## 2022 Faculty Collaborators

### Omar El Housni

Assistant Professor,  
Operations Research &  
Information Engineering



### Emma Pierson

Assistant Professor,  
Information Science



### Nikhil Garg

Assistant Professor,  
Operations Research &  
Information Engineering



### Tapan Parikh

Associate Professor,  
Information Science



### Andrea Lodi

Professor



### Noah Snavey

Associate Professor,  
Computer Science,



### Rajalakshmi Nandakumar

Assistant Professor,  
Information Science



### Huseyin Topalogu

Professor, School  
of Operations  
Research &  
Information Engineering



## Visiting Lecturers

Yasmeen Pattie  
Stephen Stainbrook

## Students Coordinators

Rebecca Lassman  
Lars Kouwenhoven  
Harrison Yu  
Rebecca Lassman  
Conor Lyman  
Max Dumas  
Preksha Agarwal  
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Yifu Liu  
Jiahao Dong  
Jenny Liu

## Graphic Design

Ben Oldenburg

# THANK YOU

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# What's Next?

## Welcome 2023 Urban Tech Fellows

The Jacobs Urban Tech Hub is proud to announce our first cohort of Urban Tech Fellows. This group of creative and dynamic researchers, thinkers, and practitioners will support and expand the mission of the Hub.

Urban Tech Fellows will originate and undertake research in specific urban tech domains including mobility, infrastructure and/or climate change. Our incoming cohort includes leading professionals from real estate, mobility and social services.



**Rasmi Elasmr**



**Paul Salama**



**Cara Eckholm**



**Greg Lindsay**



**Mirtha Santana**

## SCNY Urban Tech Summit 2022

On October 24th and 25th, we will focus on the NYC Urban Tech Ecosystem's efforts to address Climate Mobilization. We are curating a collection of talks, panels and interactive workshops to delve deeply into the two urban systems that contribute the most to the climate crisis: buildings and transportation systems.

## Urban Tech 101

The Hub has been developing a curriculum to help public sector officials better understand the impacts of technology on city operations and management. The first module of this educational initiative will focus on data privacy, security and decision making. Led by Meg Young and Nneka Sobers, this 8-week program will help expand the Hub's mission of sharing knowledge to improve life and equity in cities.



**Nneka Sobers**



**Meg Young**  
Visiting Fellow



Visit [urban.tech.cornell.edu](http://urban.tech.cornell.edu)