Data-Driven Policing

Georgia Tech, Atlanta Police Department Use Public Data to Optimize City’s Officer Patrol Zones

ALYSON POWELL
INSTITUTE FOR PEOPLE AND TECHNOLOGY

In an effort to reduce police officer response times to calls for assistance, Georgia Tech and the Atlanta Police Department (APD) partnered on a yearlong project to reconfigure patrol areas across the city.

Yao Xie, assistant professor in the H. Milton Stewart School of Industrial and Systems Engineering, analyzed multiple data sources — 911 calls, traffic data from the Georgia Department of Transportation, and Atlanta census numbers — to identify patrol patterns and help predict future officer workloads. She then used the data to update the city’s zones and beats, which determine where to allocate officers across the city.

“It’s important to design these beats and zone boundaries efficiently; this critically impacts response time,” said Xie. “Someone calls 911, how fast do police officers respond?”

See DATA, page 4

Lyubomir Lichev: Building Coordinator, Tech Student

VICTOR ROGERS
INSTITUTE COMMUNICATIONS

As a building coordinator for the School of Biological Sciences, Lyubomir “Lyubo” Lichev takes care of the facility, but more importantly, he takes care of people.

Every workday is different, he said, but each begins at 7 a.m. with a walk through the Cherry Emerson Building to ensure everything is in place from the previous night and ready for the new day.

“Building Coordinator 1 is a very diverse job,” Lichev said. “I handle small things like issuing keys to lab members and putting fuel into the vehicles, to bigger projects like taking inventory of equipment and handling the disposal of old equipment.”

He said he likes helping professors fill their day-to-day needs in the lab, and it’s a rewarding feeling to know that he made someone’s day brighter. He also likes interacting with new people as he does his work.

“The School of Biological Sciences is a big school, so I meet new faces every day,” said Lichev, who is also an industrial and systems engineering Tech student. “It makes an interesting conversation when I meet classmates outside the classroom while working.

Lichev grew up in Bulgaria and earned a bachelor’s degree in manufacturing engineering from the Technical University of Sofia in 2008. He moved to the United States 10 years ago at age 22, leaving his entire family in Bulgaria. Only three of his classes from Bulgaria were transferable to the U.S., so he effectively had to start college again. In 2017, he earned an associate’s degree in engineering from Georgia State University – Perimeter College. He’s currently a part-time Tech student in his third year.

“The industrial engineering degree I’m pursuing at Tech is a natural follow-up to the manufacturing degree I earned in Bulgaria,” he said. “To me, the industrial engineering degree here shows how a business runs and how we can make it run better. It is very versatile and is the right one for me.”

See LICEV, page 3

Contraceptive Jewelry Could Offer a New Family Planning Approach

JOHN TOON
INSTITUTE COMMUNICATIONS

Family planning for women might one day be as simple as putting on an earring.

A report published recently in the Journal of Controlled Release describes a technique for administering contraceptive hormones through special backings on jewelry such as earrings, wristwatches, rings, or necklaces. The contraceptive hormones are contained in patches applied to portions of the jewelry in contact with the skin, allowing the drugs to be absorbed into the body.

Initial testing suggests the contraceptive jewelry may deliver sufficient amounts of hormone to provide contraception, though no human testing has been done yet. A goal for the new technique is to improve user compliance with drug regimens that require regular dosages. Beyond contraceptives, the jewelry-based technique might also be used for delivering other drugs through the skin.

“The more contraceptive options that are available, the more likely it is that the needs of individual women can be met,” said Mark Prausnitz, a Regents Professor and the J. Eskisev Love Jr. chair

See JEWELRY, page 4
**EVENTS**

**ARTS AND CULTURE**

**April 5-6**
DramaTech Theatre presents A Midsummer Night’s Dream from 8 to 11 p.m. at its black box theater, back side of the Ferst Center for the Arts. Additional showings also take place April 11-13 and April 18-20. dramatech.org

**April 7**
The Georgia Tech Chorales, Chamber Choir, and Women’s Choir are invited to host their lectures, meetings, and events in one of the most innovative and sustainable buildings in the Southeast.

**Georgia Tech** seeks to construct and operate The Kendeda Building to the Living Building Challenge certification standard, the world’s most rigorous sustainable design and performance standard for buildings. As such, The Kendeda Building will abide by strict construction guidelines as well as operating procedures. This includes harvesting more energy than it uses on site through renewable sources, as well as collecting, treating, and reusing more water than it needs on an annual basis.

“We are excited to showcase The Kendeda Building to the campus community,” said Shan Aroz, director of The Kendeda Building. “By design, it will necessitate that we think differently about how to occupy and use a building. It’s an educational process for us all.”

At this time, The Kendeda Building is available for reservations from October 28 to December 19, 2019. Rooms available for booking include a 170-person auditorium, conference room, three classrooms, and four class laboratories. Georgia Tech students, faculty, and staff will receive priority in making reservations until April 19, when space in The Kendeda Building will be open to the broader community.

Visit c.gatech.edu/kendeda-res for additional details and to request a reservation. Learn more about the project at livingbuilding.gatech.edu.

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**SEMINARS AND LECTURES**

**April 2**
The Center for the Study of Women in Science and Technology hosts its 2019 distinguished lecture featuring E.A. Griswold Professor of Geophysics and Vice President for Research at the Massachusetts Institute of Technology Maria Zuber. Zuber will discuss Advancing Gender Equity across the Solar System at 4 p.m. in the Clary Theatre, Bill Moore Student Success Center. RSVP to mary.fox@gatech.edu.

**April 3**
Anderson D. Smith, Regents Professor Emeritus in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 4**
Aurora Tsai, postdoctoral fellow in the School of Modern Languages, will discuss Language and Identity for Mixed-Race and Mixed-Heritage Individuals from 11:15 a.m. to 12:15 p.m. in Room 106, Swann Building.

**April 4-6**
The Robert C. Williams Museum of Papermaking hosts two exhibits, Postage Required and Marvelous Marbling. The museum is open weekdays from 9 a.m. to 5 p.m.

**April 5**
The School of Public Policy hosts the 2019 distinguished lecture from 3 to 4:30 p.m. in the Clary Federal Reserve Bank of Atlanta, and chief executive officer of the Success Center.

**April 7**
The Georgia Tech Chorales, Chamber Choir, and Women’s Choir present a concert of uplifting music for spring at 3 p.m. in Room 175, West Village.

**April 9**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 10**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 11-13**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 13-14**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 14**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 16**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 17**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 18**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 19**
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**April 20**
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**April 21**
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**April 22**
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**April 24**
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**April 25**
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**April 26**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 27**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 29-30**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

**April 30**
Aurora Tsai, postdoctoral fellow in the School of Psychology, will discuss his career — Half a Century as a Psychologist — from 3 to 4 p.m. in Room 250, J.S. Coon Building.

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**LYNN DURHAM JOINS EXECUTIVE LEADERSHIP TEAM**

Lynn Durham, associate vice president (AVP) and chief of staff, has been appointed to serve on Georgia Tech’s Executive Leadership Team (ELT). Also on the team are President G.P. “Bud” Peterson, Provost Rafael Bras, Executive Vice President for Research Chaouki Abdallah, and Interim Executive Vice President for Administration and Finance Jim Fortner. A member of the President’s Cabinet, Durham has served unofficially as a member of the ELT since August 2018.

As AVP and chief of staff, Durham has led campus initiatives in areas such as student mental health, sexual violence prevention, and ethics awareness. She led the search for the general counsel and vice president for ethics and compliance. She directs the operations of the Office of the President, including financial and administrative functions, and represents the president and the Institute through interactions with faculty, student leaders, alumni, corporate and other external partners, government leaders, and the University System of Georgia Board of Regents. Durham joined Georgia Tech in 1993, managing the legislative advocacy program in the Office of Government and Community Relations. In 2006, she joined the Office of the President, assuming her current position in 2010. She has served as a co-instructor for GT 1000 classes for seven years, represents Georgia Tech as a member of the Board of Directors of the Atlanta Science Festival, and is a board member of the Georgia Center for Oncology Research and Education. She holds a Bachelor of Arts in Political Science from Radford University and a Master of Public Administration from Kennesaw State University. She is currently working on her Doctor of Education (Ed.D.) in Higher Education Management from the University of Georgia.

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**THE KENDEDA BUILDING**

**KENDEDA BUILDING**

The Kendeda Building for Innovative Sustainable Design, pictured during construction in January, will be ready for campus use this fall.

**Host Your Fall Event at The Kendeda Building for Innovative Sustainable Design**

**RACHEL FOCKE ANDREW**

**INSTITUTE COMMUNICATIONS**

The Kendeda Building will abide by strict construction guidelines as well as operating procedures. This includes harvesting more energy than it uses on site through renewable sources, as well as collecting, treating, and reusing more water than it needs on an annual basis.

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Visit c.gatech.edu/kendeda-res for additional details and to request a reservation. Learn more about the project at livingbuilding.gatech.edu.
AWAY FROM WORK

Lichev stands on the Atlantic Drive walkway, near where he works and studies. Tech students can relate to that,” he said. “After graduation, I will develop some hobbies. For now, sleep is my best friend.” He keeps in touch with his family in Bulgaria through weekly video chats. He said that because of the seven-hour time difference, finding a good time for everyone to talk can be tricky.

His most recent trip to Bulgaria was Christmas 2018. Before then, he hadn’t been there since 2014 when he made a surprise visit on his father’s 50th birthday. “I’m not going to wait another four years before I go back,” he said. “If I can, I’ll go back this year.”

THE WHISTLE • whistle.gatech.edu

April 1, 2019 • PAGE 3

FACULTY AND STAFF ACHIEVEMENTS

Kristin Berthold, director of finance and administration in Auxiliary Operations, earned the Certified Auxiliary Services Professional designation from the National Association of College Auxiliary Services.

Constellations Center for Equity in Computing Senior Director Kanam Bobb was recently named to the board of trustees of AnitaB.org.

Kelly Comfort, professor in the School of Modern Languages, received 2019’s Most Promising New Textbook by the Textbook & Academic Authors Association for their book,Introducción a la literatura latinoamericana del siglo XX, 1st ed., (Published by Georgetown University Press).

Magnus Egerstedt, the Steve W. Chaddick School Chair of the School of Electrical and Computer Engineering, has been elected as a Foreign Member of the Royal Swedish Academy of Engineering Sciences. Egerstedt is being honored for his work on multi-robot systems and for his previous role as the executive director for the Institute for Robotics and Intelligent Machines at Georgia Tech. He will be recognized at a ceremony in Stockholm, Sweden, in October.

Katherine Fu and Marta Hatzell, assistant professors in the George W. Woodruff School of Mechanical Engineering, have each received the Faculty Early Career Development (CAREER) Award from the National Science Foundation (NSF). The award supports junior faculty who exemplify the role of teacher-scholars.

Omer Inan, associate professor in the School of Electrical and Computer Engineering, was honored as the Georgia Power Professor of Excellence for the College of Engineering. He was recognized at a men’s basketball game between Georgia Tech and the University of North Carolina in January.

Charles Isbell, executive associate dean and professor in the School of Interactive Computing, was named a 2019 Association for the Advancement of Artificial Intelligence (AAAIA) Fellow. Isbell was honored at a ceremony held during the 33rd AAAIA Conference on Artificial Intelligence (AAAIA-19) in Honolulu, Hawaii, in late January.

Laurence Jacobs, associate dean for Academic Affairs and professor in the School of Civil and Environmental Engineering, earned a lifetime achievement award from SPIE, the international society for optics and photonics. Jacobs was honored at the organization’s 2019 Noyce Scholarship 50th Anniversary Conference.

Satish Kumar, associate professor in the George W. Woodruff School of Mechanical Engineering, has been elected a fellow of the American Society of Mechanical Engineers (ASME). ASME’s Committee of Past Presidents confers the fellow grade of membership to recognize their outstanding engineering achievements. This distinction has been bestowed upon only 3 percent of more than 100,000 ASME members.

Kim Kurpis, professor in the School of Civil and Environmental Engineering, is the 2019 winner of the Arthur R. Anderson Medal from the American Concrete Institute, given for excellence, creativity, and leadership in concrete. Kurpis is just the second woman to win the medal in its nearly 50 years of existence.

Aya McDaniel, lecturer of Japanese in the School of Modern Languages, was named the 2019 Japanese Teacher of the Year by the Georgia Association of Teachers of Japanese. The award honors one K-12 and one college-level Japanese teacher each year.

Patrice Miles, assistant dean of Business Operations for Professional Education, received the 2019 Walton S. Bittner Service Citation for Outstanding Service in UPCEA. This award is given to express appreciation for outstanding service in professional, continuing, and/or online education at and service of major significance to UPCEA.

Moinuddin Qureshi, professor in the School of Electrical and Computer Engineering, received the Persistent Impact Prize at the 10th Annual Non-Volatile Memory Workshop in March in San Diego, California.

Maryam Saedifard, associate professor in the School of Electrical and Computer Engineering, has been selected as the recipient of the 2019 Institute of Electrical and Electronics Engineers (IEEE) Region 3 Outstanding Engineer Award. She will be presented with this honor at the IEEE Region 3 Awards Dinner on April 13 in Huntsville, Alabama, during IEEE SoutheastCon 2019.

Natalie Stiglitz, professor with a joint appointment in the School of Materials Science and Engineering and School of Chemical and Biomolecular Engineering, was named a 2019 Materials Research Society Fellow for her contributions to the application of polymer science for the design and processing of organic and electronic materials and devices.

Jimeng Sun, associate professor in the School of Computational Science and Engineering, was named as one of the top 100 global leaders in artificial intelligence for health, according to Deep Knowledge Analytics’ Top 100 AI Leaders in Drug Discovery and Advanced Healthcare.

Eberhard Voit, professor in the Wallace H. Coulter Department of Biomedical Engineering and a researcher in the Petit Institute for Biomechanics and Biomechanics, has been named a Society for Mathematical Biology (SMB) Fellow, one of the first for the organization’s history. Voit is one of only two new SMB fellows worldwide in 2019.

Marilyn Wolf, Farmer Distinguished Chair in Embedded Computing Systems and Georgia Research Alliance Eminent Scholar, has been selected to receive the IEEE Computer Society 2019 Harry H. Goode Award for “contributions to embedded, hardware-software co-design, and real-time computer vision systems.”
DATA, from page 1

Currently, the average police response time to the city's highest priority calls is 13 minutes. Although they haven't publicly discussed a target response time, APD says the beat redesign will help to balance workloads across zones, with the goal of answering calls for assistance more quickly. “Response time is something that you always want to manage and improve so that you’re delivering quality service to people,” said Major John Quigley, executive officer of the APD’s Strategy and Special Projects Division. “Everybody benefits from better service, whether it’s answering a 911 call or the follow-up investigation.”

The City of Atlanta is divided into six geographic areas or zones, with each zone split into 13 or 14 beats assigned to one patrol officer. Each officer is responsible for responding to all of the 911 calls in their assigned beat, everything from traffic incidents to serious crime. The redesign affects three zones: Zone 6 in East Atlanta will increase by 4 square miles, while Zone 1 in Northwest Atlanta will grow by 2 square miles. Zone 2, which covers Northeast Atlanta and Buckhead, will decrease by 7 square miles.

Recently, the Buckhead district has seen a spike in car thefts, burglaries, and armed robberies. At a town hall meeting with concerned residents in early March, Atlanta Police Chief Erika Shields discussed how a smaller zone will allow officers to respond more quickly to 911 calls.

In a statement about the beat redesign, APD Deputy Chief Jeff Glazier said, “It’s important that we examine our officer workload periodically, and with the help of Georgia Tech we were able to do so in a data-driven manner. We are confident these changes will balance the workload in all zones.”

Zone optimization also addresses Atlanta’s growing population, which has resulted in an increase in 911 calls and more work for the understaffed police force currently facing a shortage of 400 officers. Atlanta’s City Council voted in February to approve a rezoning plan in order to accommodate a 13-unit-per-square-mile increase in population, which has resulted in an increase in 911 calls and more work for the understaffed police force currently facing a shortage of 400 officers. Atlanta’s City Council voted in February to approve a rezoning plan in order to accommodate a 13-unit-per-square-mile increase in population, which has resulted in an increase in 911 calls and more work for the understaffed police force currently facing a shortage of 400 officers.

The redesign initiative is Xie’s second research project in partnership with the APD and funded by the Atlanta Police Foundation. In 2017, she developed an algorithm that quickly analyzes incident reports to find connections between crimes. Xie will soon begin working with the City of South Fulton to analyze its police zones, which haven’t been updated since the 1970s.

JEWELRY, from page 1

In the School of Chemical and Biomolecular Engineering. “Because putting on jewelry may already be part of a woman’s daily routine, this technique may facilitate compliance with the drug regimen. This technique could more effectively empower some women to prevent unintended pregnancies.”

This proof-of-concept research was supported by the U.S. Agency for International Development under a subcontract funded by FHI 360.

Contraceptive jewelry adapts transdermal patch technology that is already used to administer drugs that prevent motion sickness, support smoking cessation, and control the symptoms of menopause, but have never been incorporated into jewelry before. Contraceptive patches are also already available, but Prausnitz believes pairing them with jewelry may prove attractive to some women — and allow more discreet use of the drug delivery technology.

Read more about the technology at news.gatech.edu.

REAL ESTATE/ROOMMATES

Looking for two female roommates to share beautiful 2BR/1BA townhome in convenient West Midtown location. Quiet street, great layout, no pets, house shares, fully furnished. Contact kat.craig10495@gmail.com.

Tech professors looking for responsible, unmarried single person/couple (no pets) to live in independent, elegant, furnished 1BR w/ kitchen in bungalow extension in beautiful Marietta/Atlanta Highlands. Walk to Piedmont Park, BeltLine, shops, etc. $1,560/month. Contact aka@byah.com.


Sitting room available for one or two people. 2BR/1BA peaceful, furnished waterfront cottage with a view located on the southern Outer Banks near Morehead City, North Carolina. Wi-Fi, A/C, W/D, several hammocks, 400’ dock, boat slab. No smoking or pets. More info, photo, 910-578-1644. jud.neely@geatech.edu.

For rent: 4BR/2BA Grant Park home, renovated w/ modern interior, approximately 5 minutes from Tech campus. Quiet, safe neighborhood, close to Southeast BeltLine. Ideal for family w/ young kids. Can be rented w/ or w/o furniture. Contact dhaner@390.gatech.edu.

Room available in furnished 2BR/1BA Virginia-Highland apt., 1.5 miles from campus. Includes utilities (gas, electric, water, cable TV, Wi-Fi) and use of laundry facilities. Contact carol.cole3@bellsouth.net.

MISCELLANEOUS

2.6 cu. ft. Magic Chef compact refrigerator, 250+ OBQ. Contact pamaviga@outlook.com.

Light beige dining room table w/ extra leaf, 8 chairs, china hutch, $400 for all. Must pick up from Powder Springs. Pictures available. Contact sizzle@geatech.edu.

CATE is recruiting employees with disabilities (e.g., mobility impairments, hearing loss, learning disabilities, back pain), for a study of the impact of universal design in the workplace. Participants will be paid $100 (as long as you complete the 1.5 hour study outside of work hours). More information is available at catea.gatech.edu/accessible-workplace-study.

Looking for a carpenter partner for the daily commute from East Cobb to Tech campus. Email balesy@hotmail.com.