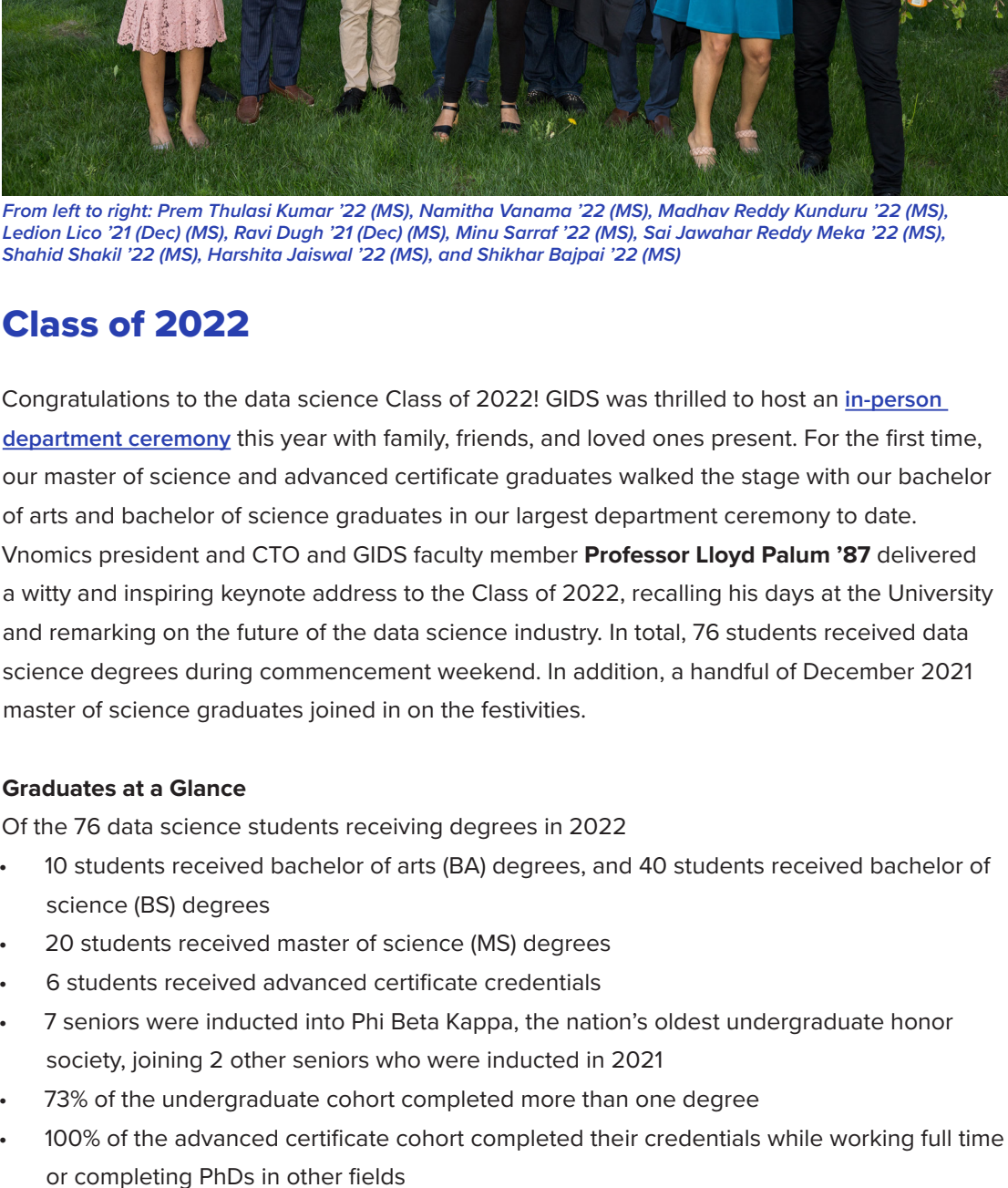


GOERGEN INSTITUTE FOR DATA SCIENCE

Spring 2022 Newsletter
From the University of Rochester



From left to right: Prem Thulasi Kumar '22 (MS), Namitha Vanama '22 (MS), Madhav Reddy Kunduru '22 (MS), Ledion Lico '21 (Dec) (MS), Ravi Dugh '21 (Dec) (MS), Minu Sarraf '22 (MS), Sai Jawahar Reddy Meka '22 (MS), Shaikh Shakil '22 (MS), Harshita Joshiwar '22 (MS), and Shikhar Bajpai '22 (MS)

Class of 2022

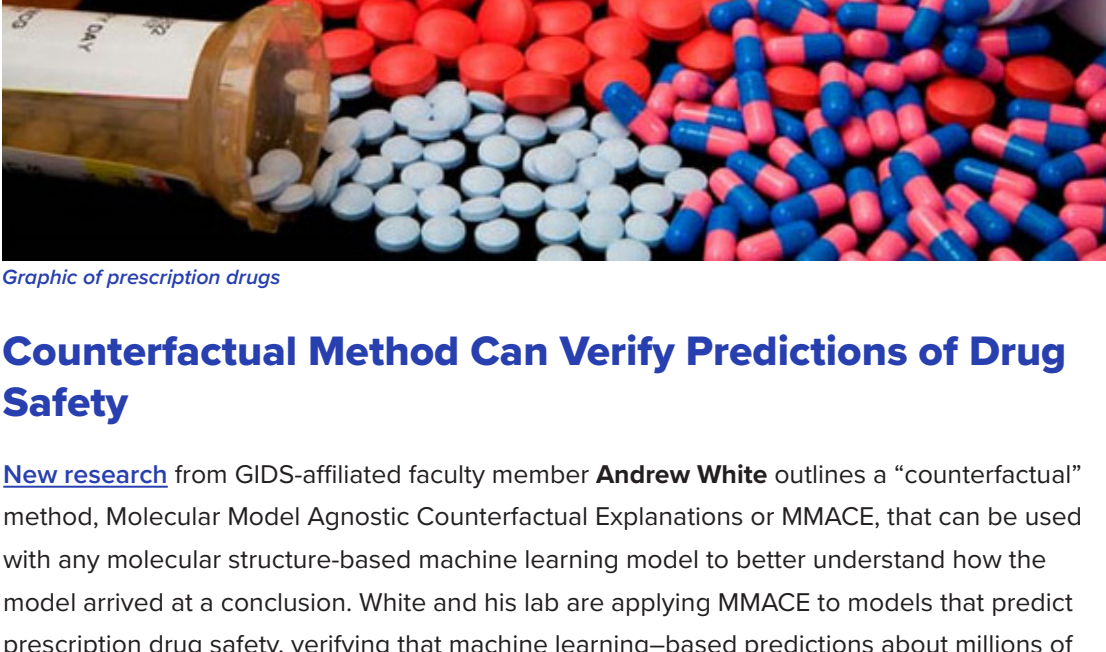
Congratulations to the data science Class of 2022! GIDS was thrilled to host an [in-person department ceremony](#) this year with family, friends, and loved ones present. For the first time, our master of science and advanced certificate graduates walked the stage with our bachelor of arts and bachelor of science graduates in our largest department ceremony to date. Vnomics president and CTO and GIDS faculty member **Professor Lloyd Calumny '87** delivered a witty and inspiring keynote address to the Class of 2022, recalling his days at the University and remarking on the future of the data science industry. In total, 76 students received data science degrees during commencement weekend. In addition, a handful of December 2021 master of science graduates joined in on the festivities.

Graduates at a Glance

Of the 76 data science students receiving degrees in 2022

- 10 students received bachelor of arts (BA) degrees, and 40 students received bachelor of science (BS) degrees
- 20 students received master of science (MS) degrees
- 6 students received advanced certificate credentials
- 7 seniors were inducted into Phi Beta Kappa, the nation's oldest undergraduate honor society, joining 2 other seniors who were inducted in 2021
- 73% of the undergraduate cohort completed more than one degree
- 100% of the advanced certificate cohort completed their credentials while working full time or completing PhDs in other fields

Congratulations again to the data science Class of 2022! We are so proud of our amazing graduates!



Lisa Pink '22 (Dec) (MS) running the 4x400 meter relay at Nazareth College's Golsano Training Center

Student Spotlight: Lisa Pink '22 (Dec) (MS)

GIDS master of science student **Lisa Pink '22 (Dec) (MS)** had an eventful second semester at Rochester! In March, Pink, who is a middle distance runner on the women's track and field team, became the [All-Atlantic Regional champion in the 800 meters](#), clocking a new facility record at Nazareth College's Golsano Training Center, winning the Women's Track Performer of the Week Award, and qualifying for the NCAA Division III national championships. At the Liberty League Conference Championship in May, Pink medaled twice, and she and her team took home the Liberty League title for the first time in school history. Finishing the semester strong, Pink joined data science capstone sponsor Constellation Brands as a summer data and analytics intern.

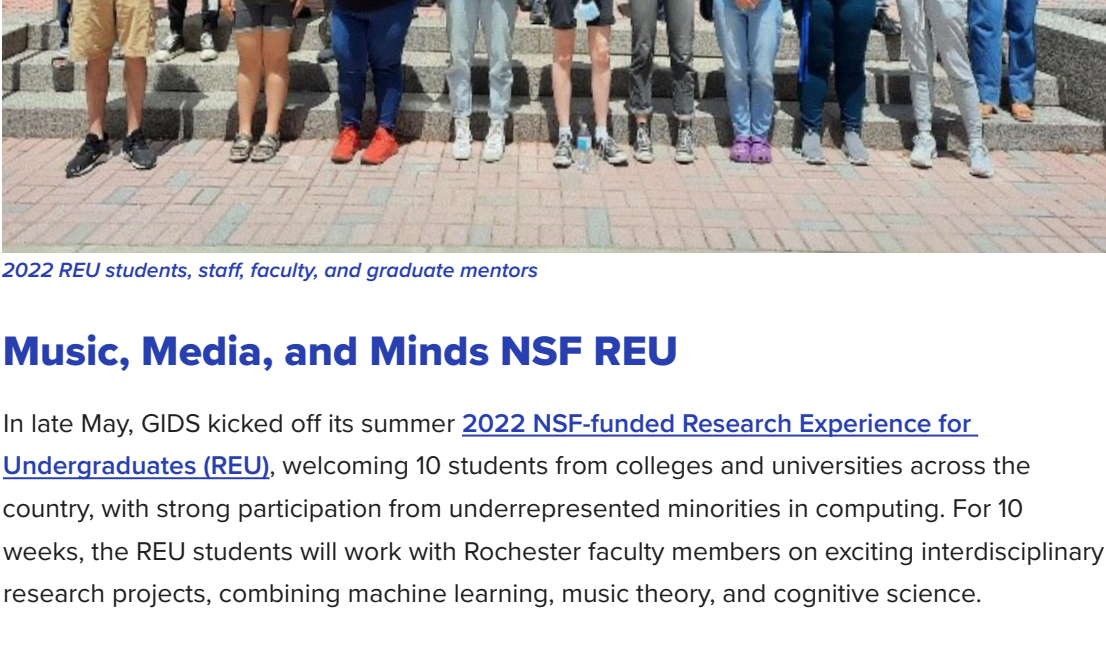
Pink says, "This was undoubtedly my toughest semester, trying to balance graduate courses with being a three-season student-athlete, participating in research, and working part time. However, I can definitely say I've gotten the most out of my grad school experience so far. I accomplished a big goal of qualifying for the URMCA D3 Nationals for cross country and track, I worked on meaningful research with the NJRMC, I improved my coding skills, and, most importantly, I formed connections with some amazing people. I'm very grateful for the opportunities I've had so far at Rochester, and [I am] looking forward to my final semester in the fall!"



Graphic of prescription drugs

Counterfactual Method Can Verify Predictions of Drug Safety

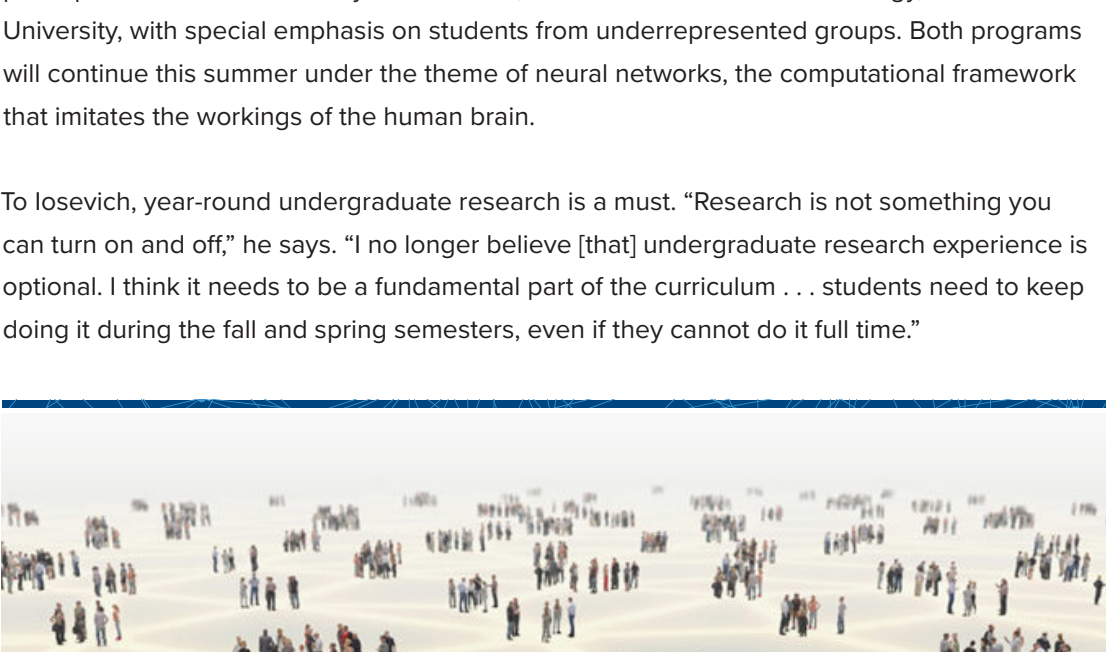
[New research](#) from GIDS-affiliated faculty member **Andrew White** outlines a "counterfactual" method, Molecular Model Counterfactual Explanations or MMACE, that can be used with any molecular structure-based machine learning model to better understand how the model arrived at a conclusion. White and his lab are applying MMACE to models that predict prescription drug safety, verifying that machine learning-based predictions about millions of potentially toxic drug compounds are as accurate as possible.



Lisa Altman '06S (MBA) with her Gwennie Award

Lisa Altman '06S (MBA) Receives 2022 Gwennie Award

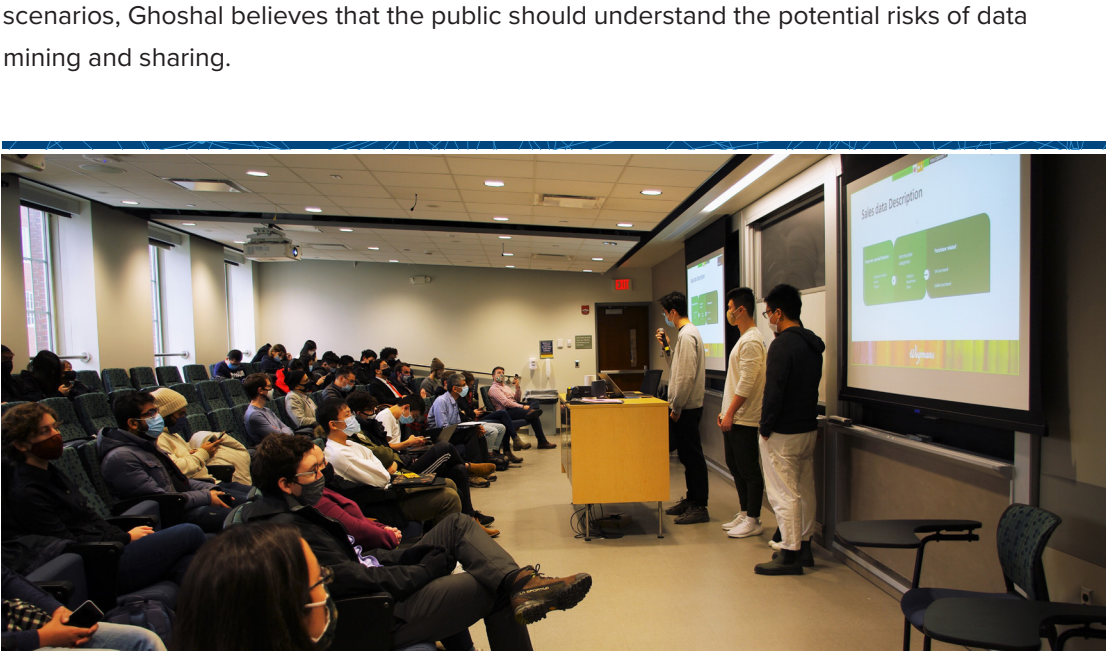
In April, GIDS education program coordinator **Lisa Altman '06S (MBA)** was awarded the [2022 Campus Partner Individual "Gwennie"](#) for her incredible contributions to career education for data science students and alumni. The Gwennies, named in honor of Greene Center benefactor Gwen M. Greene, celebrate the career education achievements of campus partners across the University. Since starting at Rochester in 2017, Altman has worked tirelessly to engage and support data science students in all of their career endeavors. Her work has enriched the lives of students and made an impact on the entire campus community. Congratulations to Lisa on this well-deserved award!



2022 SICSS faculty and participants

Summer Institute in Computational Social Science

In mid-May, GIDS assistant professor of instruction **Cantay Caliskan** led a brand-new initiative at the University. [The Summer Institute in Computational Social Science \(SICSS\)](#) brought together students, postdocs, and junior faculty from a variety of backgrounds and institutions for a two-week intensive session on computational social sciences. The program included lectures, tutorials, and participant-led research projects and kicked off with a keynote lecture from [Gary King](#), the Albert J. Weatherhead III University Professor and director of the Institute for Quantitative Social Science at Harvard University. In its first iteration, the program supported 17 participants with funding from GIDS and the Russell Sage Foundation.



2022 REU students, staff, faculty, and graduate mentors

Music, Media, and Minds NSF REU

In late May, GIDS kicked off its summer [2022 NSF-funded Research Experience for Undergraduates \(REU\)](#), welcoming 10 students from colleges and universities across the country, with strong participation from underrepresented minorities in computing. For 10 weeks, the REU students will work with Rochester faculty members on exciting interdisciplinary research projects, combining machine learning, music theory, and cognitive science.



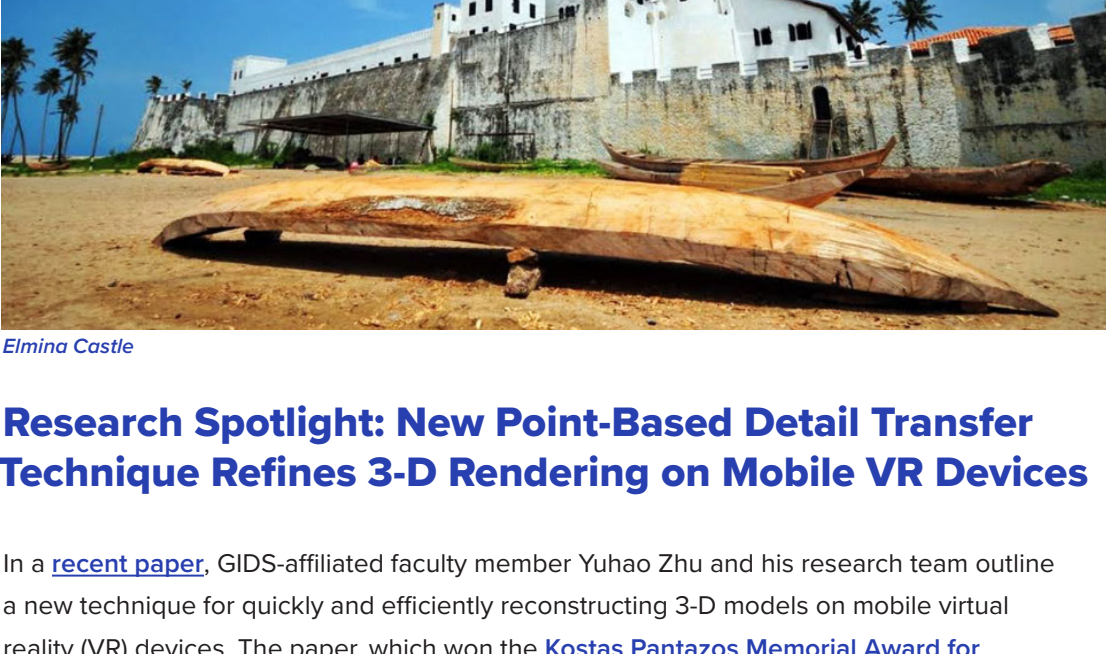
Alex Losevich with PhD student Charlotte Aten '17, '19 (MS)

Faculty Spotlight: Alex Losevich

Since his start in academia, GIDS-affiliated faculty member [Alex Losevich](#), a professor in the Department of Mathematics, has advocated for research opportunities for undergraduates. He ran informal summer research programs for undergraduates at the University of Missouri, led an NSF-sponsored Research Experience for undergraduates (REU) at the University of Rochester, and supported countless Rochester students pursuing undergraduate honors theses.

Today Losevich leads the [NSF Triposds REU and STEM for All programs](#), summer undergraduate research opportunities that focus on mathematical methods in data science. The programs, supported by the [Greater Data Science Cooperative Institute](#), have aided participants from the University of Rochester, Rochester Institute of Technology, and Cornell University, with special emphasis on students from underrepresented groups. Both programs will continue this summer under the theme of neural networks, the computational framework that imitates the workings of the human brain.

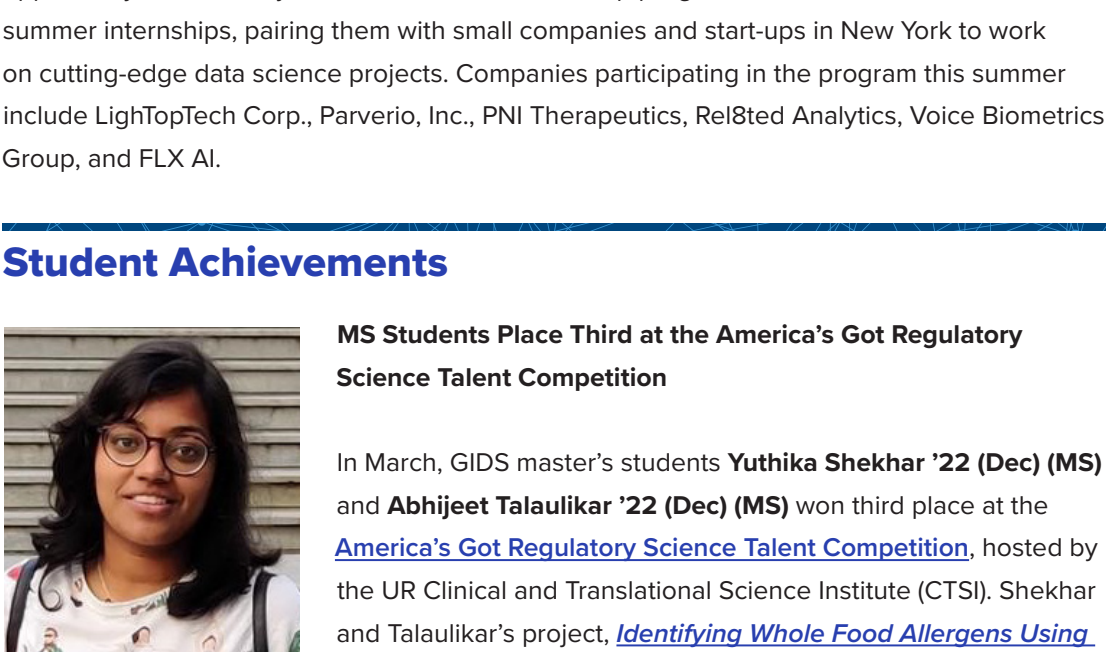
To Losevich, year-round undergraduate research is a must. "Research is not something you can turn on and off," he says. "I no longer believe [that] undergraduate research experience is optional. I think it needs to be a fundamental part of the curriculum... students need to keep doing it during the fall and spring semesters, even if they cannot do it full time."



Location tracking graphic

Location Tracking Research Delivers New Insights into Data Sharing

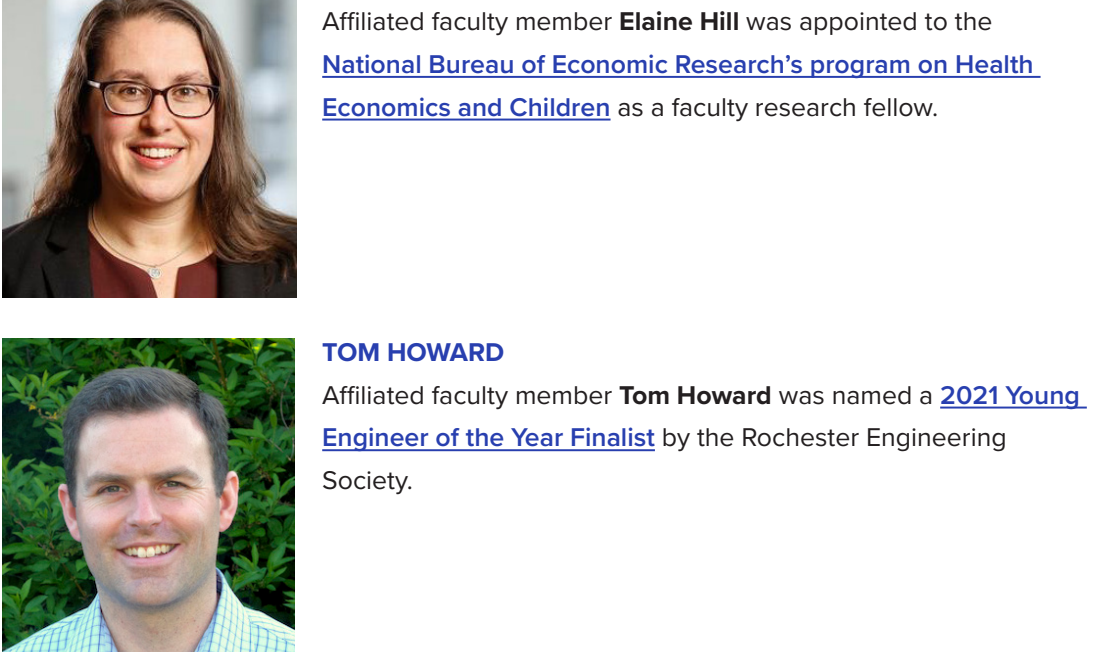
Gourab Ghoshal, the [Stephen Biggar '92 and Elizabeth Asaro '92 Fellow in Data Science](#), has uncovered [new insights](#) on location tracking data. The GIDS-affiliated faculty member and a team of researchers from the University of Exeter, the Federal University of Rio de Janeiro, Northeastern University, and the University of Vermont analyzed three location-based social network datasets composed of millions of "check-ins" across popular social media apps. Using "colocation" networks, researchers discovered that the movement patterns of friends, family, coworkers, and even strangers can offer a wealth of information needed to predict an individual's mobility patterns. While mobility pattern prediction can be beneficial in certain scenarios, Ghoshal believes that the public should understand the potential risks of data mining and sharing.



Capstone students give their final presentations to the class

Capstone Projects Give GIDS Students Hands-On Data Science Experience

This spring, 47 students completed data science [capstone projects](#), working in teams to solve real business problems using hands-on data analytics. Over the course of the semester, students cleaned and analyzed data and derived insights from it, devising creative business solutions for sponsoring organizations. The capstone initiative also received a course development grant award from the [Greene Center](#) to further expand its experiential learning offerings. In addition, a few capstone teams presented at the 2022 [Hajim Senior Design Day](#) in May. Spring 2022 capstone sponsors included Corning, URMCA, City of Rochester, Vnomics, Benchmark Labs, Rel8ted Analytics, and GIDS. For a list of past sponsors and projects, visit the [data science capstone website](#).



Graphic of perceptually enabled task guidance (PTG)

New Grant Will Explore Using AI to Guide Humans through Complex Tasks

In April, GIDS-affiliated faculty member **Chenliang Xu** and a team of collaborators from the Stevens Institute of Technology, Purdue University, and the University of Michigan received a [\\$5.9 million award](#) from the [Perceptually-enabled Task Guidance \(PTG\) program](#) of the Defense Advanced Research Projects Agency (DARPA). The project will explore using artificial intelligence (AI) to continuously train a program nicknamed MILLY. MILLY will then guide human users through complex tasks, using wearable sensors and augmented reality (AR) headsets. Xu's group is responsible for developing foundational AI capabilities that can understand egocentric audio-visual signals and pragmatically plan task procedures.



An attendee tests out AR/VR technology at the University Technology Showcase

University Technology Showcase

On April 21, the [NYS Center of Excellence in Data Science \(CoE\)](#) and the [Center for Emerging & Innovative Sciences \(CEIS\)](#) cohosted the University Technology Showcase at the Memorial Art Gallery (MAG). This annual event helps build and expand connections among industry professionals and academic researchers working in a variety of technology areas, including biomedicine, data science, optics, imaging, photonics, sensors, acoustics, materials, and many others. The 2022 showcase included a research poster session, a panel discussion on the role of arts and innovation in revitalizing downtown Rochester, and the inaugural Western New York Augmented and Virtual Reality (AR/VR) Mini Conference.

Elmina Castle

Research Spotlight: New Point-Based Detail Transfer Technique Refines 3-D Rendering on Mobile VR Devices

In a [recent paper](#), GIDS-affiliated faculty member Yuhao Zhu and his research team outline a new technique for quickly and efficiently reconstructing 3-D models on mobile virtual reality (VR) devices. The paper, which won the [Kostas Pantazos Memorial Award for Outstanding Paper in Visualization and Data Analysis](#) from the Society for Imaging Science and Technology, focused on 3-D reconstructions of Elmina Castle, a historic UNESCO World Heritage Site along the coast of Ghana. The new technique directly transfers details from the original point cloud to a UV map generated from a low-polygon mesh, increasing visual quality, preserving scene details, and enabling real-time rendering on mobile VR devices from thousands of miles away.

Center of Excellence in Data Science graphic

CoE Internship Program

This year the [NYS Center of Excellence in Data Science \(CoE\)](#) is offering an exciting new opportunity to University students. The CoE internship program will fund six students for summer internships, pairing them with small companies and start-ups in New York to work on cutting-edge data science projects. Companies participating in the program this summer include LightTopTech Corp., Parverio, Inc., PNI Therapeutics, Rel8ted Analytics, Voice Biometric Group, and FLX AI.

Student Achievements

MS Students Place Third at the America's Got Regulatory Science Talent Competition

In March, GIDS master's students **Yuthika Shekhar '22 (Dec) (MS)** and **Abhijeet Talaulikar '22 (Dec) (MS)** won third place at the [America's Got Regulatory Science Talent Competition](#), hosted by the UR Clinical and Translational Science Institute (CTSI). Shekhar and Talaulikar's project, [Identifying Whole Food Allergens Using Machine Learning](#), utilized machine learning techniques to potentially assist the FDA with food product labeling regulations. They focused on problems with labeling raw versus whole foods, creating an exhaustive list of allergens, and the absence of hierarchical allergen ontologies.

Faculty Awards and Recognition

YUHAO ZHU

Affiliated faculty member **Yuhao Zhu's** [research paper on event-driven gaze tracking](#), published jointly with Meta, won a Best Paper Honorable Mention at the IEEE VR 2022 Conference.

MICHAEL HASSELBERG

Affiliated faculty member **Michael Hasselberg** was an honoree in the 2021 [Top 50 in Digital Health](#) list by RockHealth.org.

ELAINE HILL

Affiliated faculty member **Elaine Hill** was appointed to the [National Bureau of Economic Research's program on Health Economics and Children](#) as a faculty research fellow.

TOM HOWARD

Affiliated faculty member **Tom Howard** was named a 2021 [Young Engineer of the Year Finalist](#) by the Rochester Engineering Society.

SUSANA MARCOS

Affiliated faculty member **Susana Marcos** was named a [Class of 2022 Gold Fellow](#) by the Association for Research in Vision and Ophthalmology (ARVO).

ANDREW WHITE

Affiliated faculty member **Andrew White** received the 2021 [Young Engineer of the Year Award](#) from the Rochester Engineering Society.

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