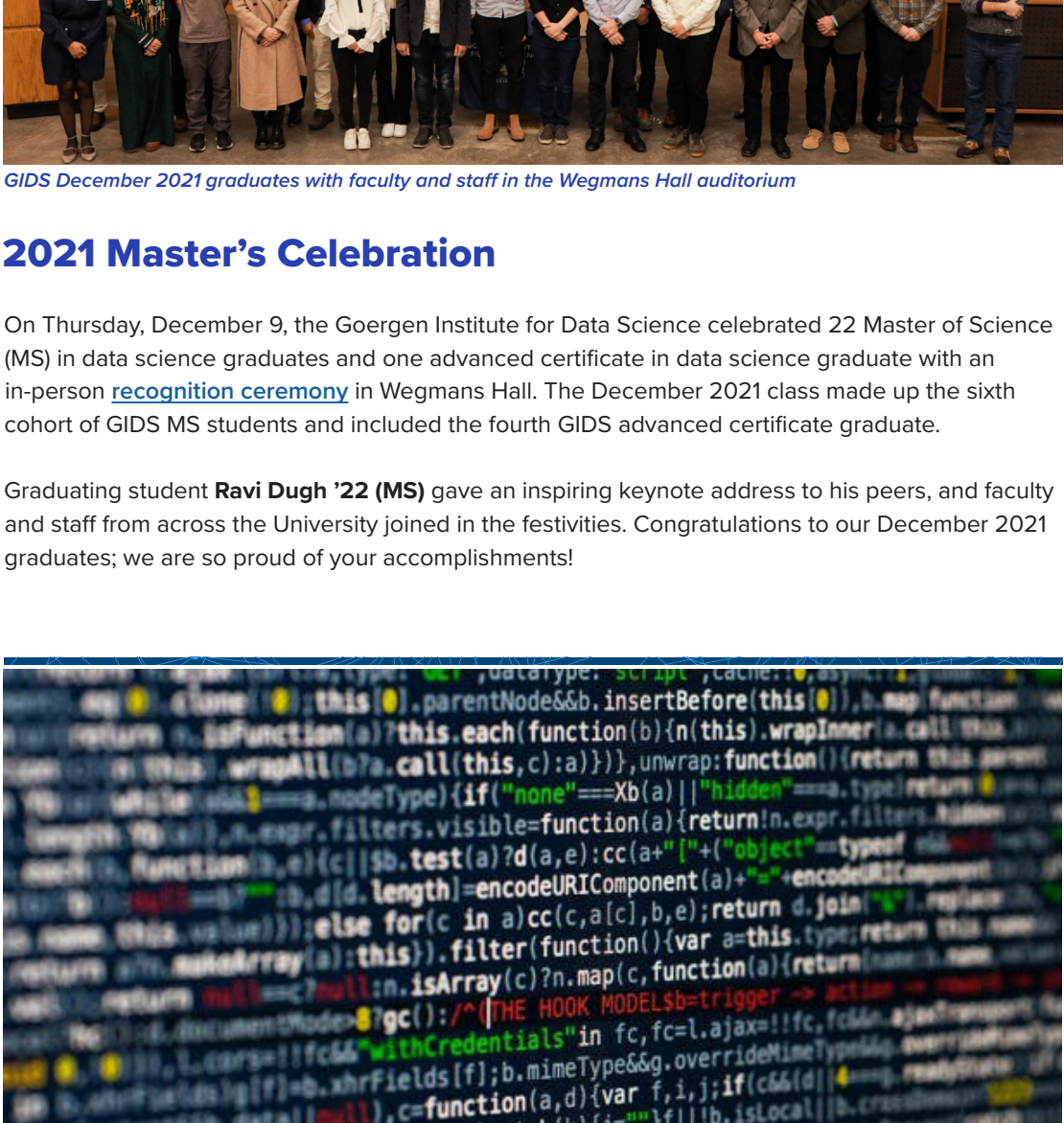


GOERGEN INSTITUTE FOR DATA SCIENCE

Fall 2021 Newsletter
From the University of Rochester

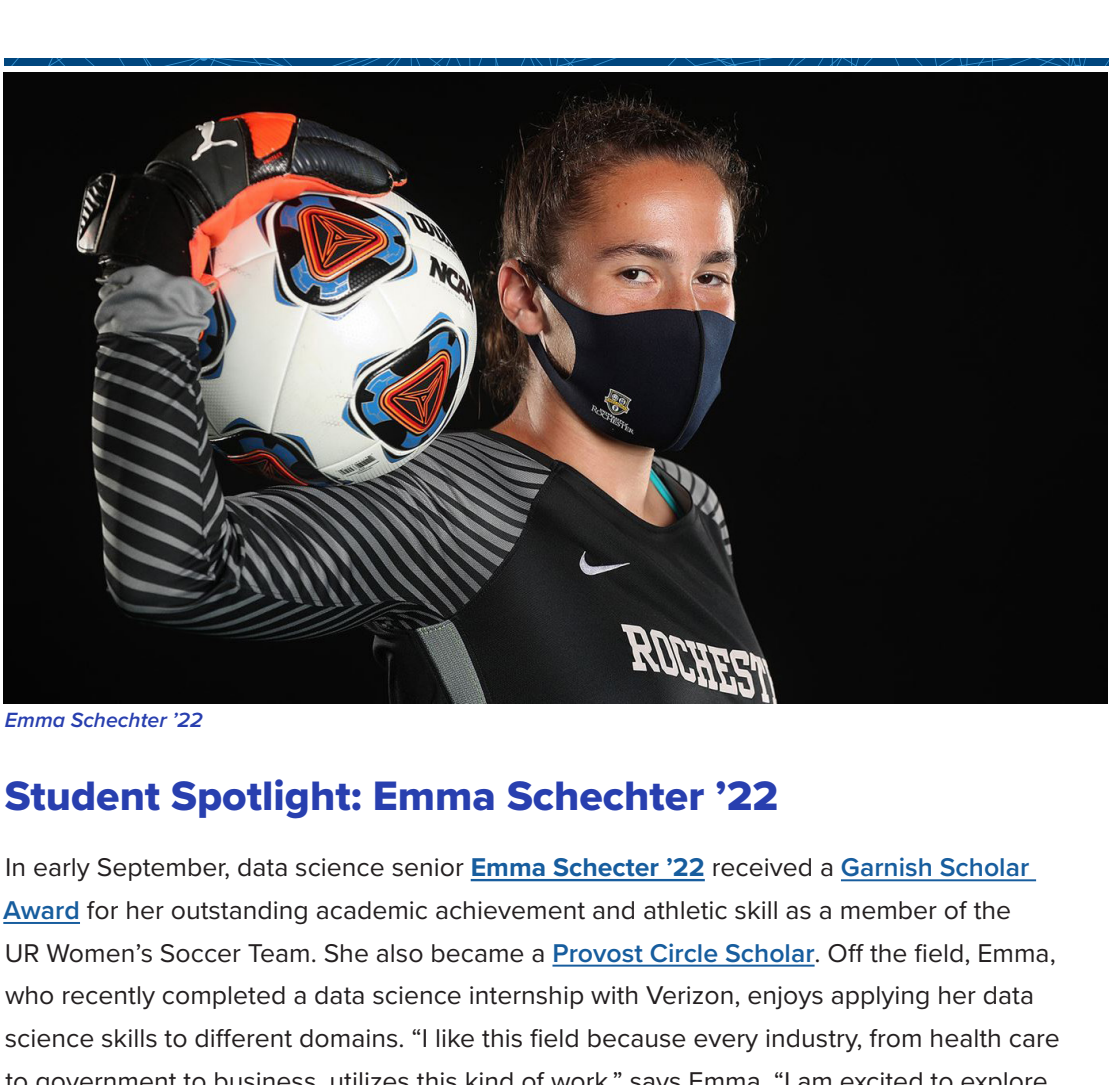


GIDS December 2021 graduates with faculty and staff in the Wegmans Hall auditorium

2021 Master's Celebration

On Thursday, December 9, the Goergen Institute for Data Science celebrated 22 Master of Science (MS) in data science graduates and one advanced certificate in data science graduate with an in-person [recognition ceremony](#) in Wegmans Hall. The December 2021 class made up the sixth cohort of GIDS MS students and included the fourth GIDS advanced certificate graduate.

Graduating student **Ravi Dugh '22 (MS)** gave an inspiring keynote address to his peers, and faculty and staff from across the University joined in the festivities. Congratulations to our December 2021 graduates; we are so proud of your accomplishments!



Coding graphic

Over the Summer...

In July, GIDS hosted 10 high school students for a week-long data science immersion as part of the [Hajim Engineering School's Pre-College Summer Intensives](#). GIDS Deputy Director Ajay Anand and data science master's student **Shikhar Bajpai '22 (MS)** led the intensive, introducing students to basic data science concepts and techniques. After picking up the basics, student applied their learning to a wide variety of projects with real-world applications, including using deidentified patient records to develop an automated machine learning algorithm that predicts the likelihood of cardiac disease and designing an email spam filter using text analysis. Students also completed a final project, deriving insights from a large data set in their chosen field of interest (such as sports, music, movies, and business) using a variety of data visualization tools. At the end of the week, they presented their findings to their teachers and peers.

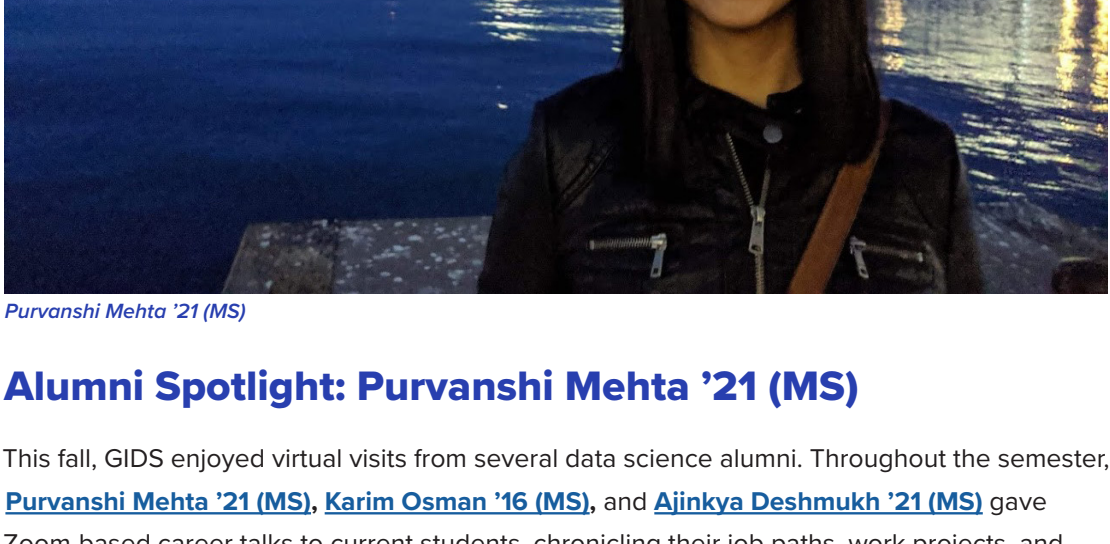
In late August, the GIDS life sciences and biomedical data science working group, led by co-chairs **Amanda Larracuente**, **Andrew McDavid**, and **Matthew McCall**, hosted the [2021 UR Biomedical Data Science Hackathon](#). Students from across the University joined to compete for cash prizes, and the hackathon, in its second year, more than doubled its participation from 2020.



Emma Schechter '22

Student Spotlight: Emma Schechter '22

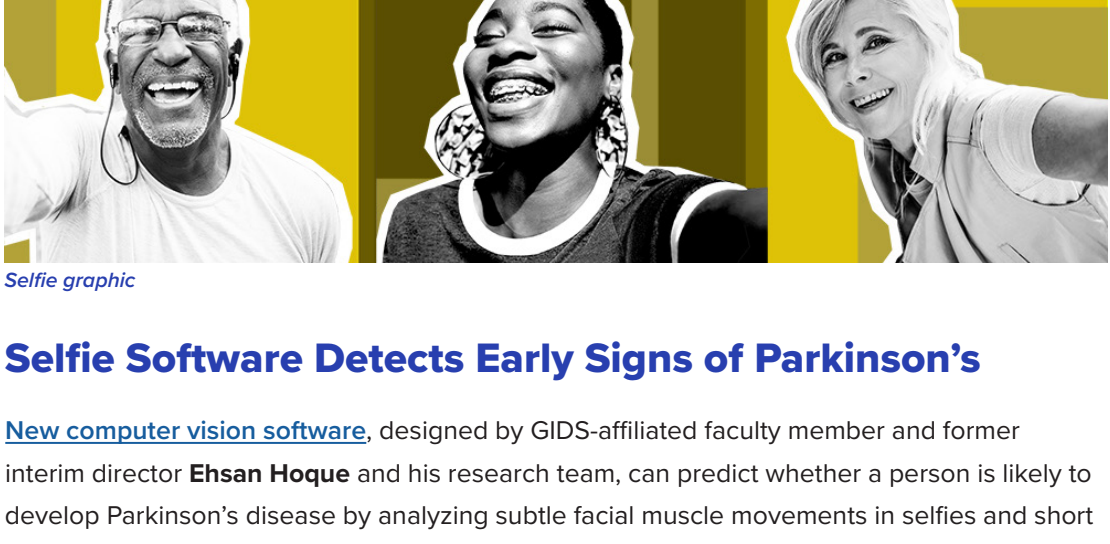
In early September, data science senior **Emma Schechter '22** received a [Garnish Scholar Award](#) for her outstanding academic achievement and athletic skill as a member of the UR Women's Soccer Team. She also became a [Provost Circle Scholar](#). Off the field, Emma, who recently completed a data science internship with Verizon, enjoys applying her data science skills to different domains. "I like this field because every industry, from health care to government to business, utilizes this kind of work," says Emma. "I am excited to explore different domains and find a path where I can combine multiples of my different interests."



Screen shot of the Center of Excellence in Data Science site (shown, physics PhD student Jim Baker examines data sets from his research at the VISTA Collaborator)

Center of Excellence in Data Science Awards over \$700,000 to 12 Projects

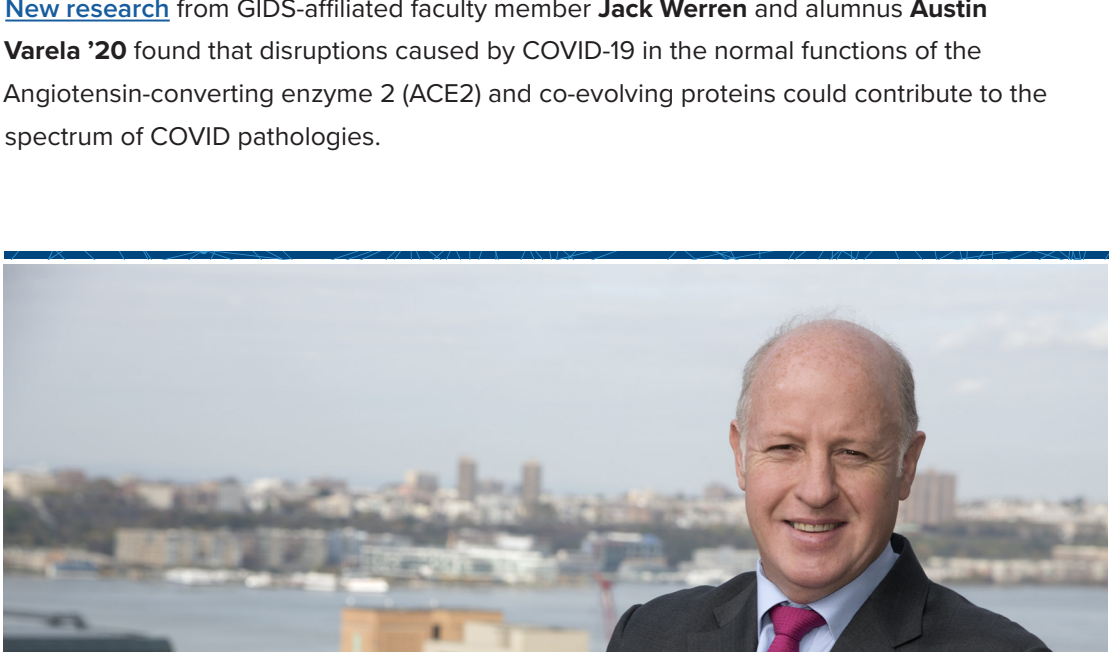
The Center of Excellence (CoE) in Data Science at the University of Rochester aims to create regional and statewide economic impact by supporting research, training, and business development partnerships in data science. As part of that mission, the NYSTAR-funded center, led by director **Mujdat Cetin**, supports research projects conducted collaboratively by universities and companies in New York State. This fall the CoE announced that it would award \$703,271 in funding to [12 new collaborative research projects](#). Organizations involved in the projects use data science to solve pressing questions in domains such as health care, retail, optics, gaming, augmented and virtual reality, and audio and speech technologies. More information about the center's collaborative funding program can be found on the [CoE website](#).



Student Isabel Kenney '22 (MS) presents a capstone project sponsored by Wegmans as her teammates look on.

Students Gain Real-World Experience through Data Science Capstone Course

In the fall 2021 semester, 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. Sponsors included Databricks, MacroXStudio, Wegmans, the Rochester-Genesee Regional Transportation Authority (RTS), Paychex, Agrograph, University of Rochester Utilities, and the Goergen Institute for Data Science. For a list of past sponsors and projects, visit the [data science capstone website](#).



Purvanshi Mehta '21 (MS)

Alumni Spotlight: Purvanshi Mehta '21 (MS)

This fall, GIDS enjoyed virtual visits from several data science alumni. Throughout the semester, **Purvanshi Mehta '21 (MS)**, **Karim Osman '16 (MS)**, and **Aiinkya Deshmukh '21 (MS)** gave Zoom-based career talks to current students, chronicling their job paths, work projects, and tips for a career in data science.

GIDS caught up with Purvanshi Mehta, currently a data scientist with Microsoft's security research group in Atlanta, Georgia, to discuss how her experience at Rochester helped her career.

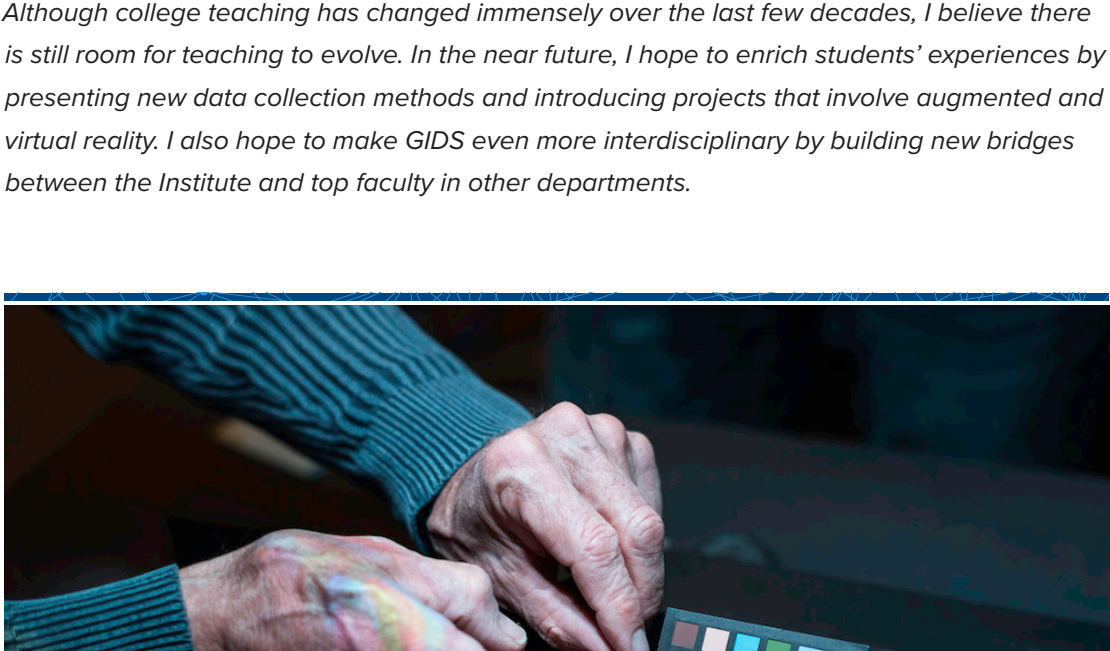
Q: What did you get out of the Master of Science (MS) in data science program?

A: The GIDS MS program helped me to grow both professionally and personally. I was part of the National Research Traineeship (NRT) program at UR, which gave me breadth of knowledge in different AI fields, such as computational neuroscience, robotics, and linguistics. The course exposed me to current research in these fields and helped me to define my own direction. The core data science courses I took were also very useful for my interviews and research. I had access to tons of networking opportunities, which helped me in my job search.

Q: How do you use your MS degree in your current role?

A: I use the core data science courses (Machine Learning, Random Processes, and Advanced Computer Vision) in my everyday work. My course projects also helped me to learn how to investigate data and propose new algorithms. My research helped me to understand and analyze real-life data to my job better. Finally, the capstone project, which involves industry collaboration, helped me to apply a business perspective to data science. Early on, I learned the importance of communicating data results to higher management and wider audiences.

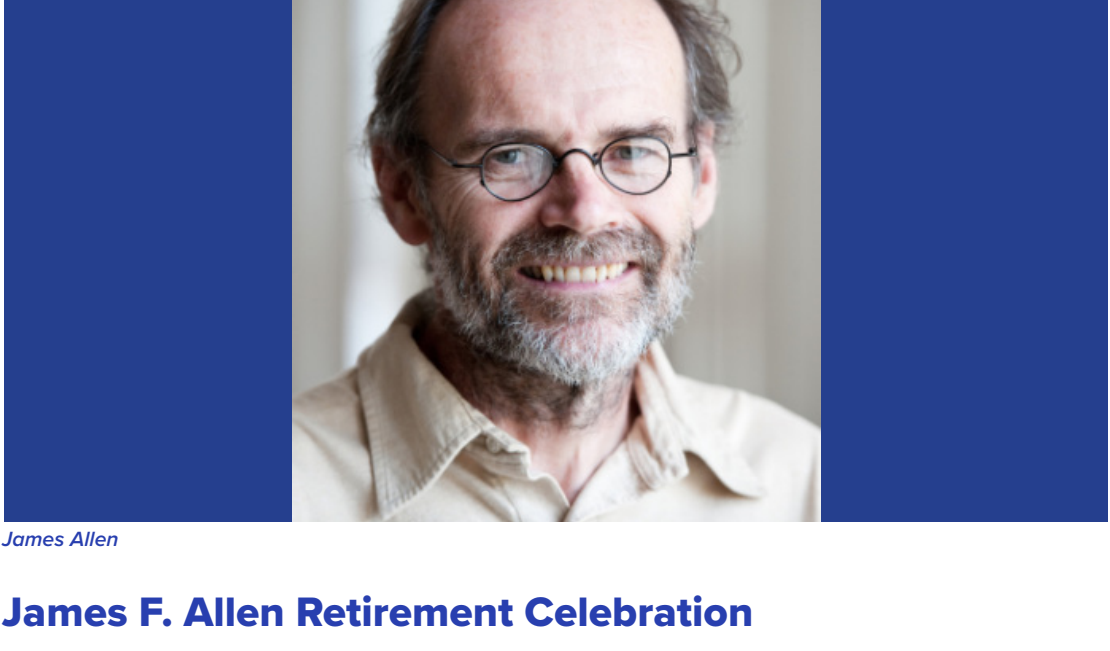
Thank you to all our stellar alumni for staying engaged and giving back the GIDS community!



Selfie graphic

Selfie Software Detects Early Signs of Parkinson's

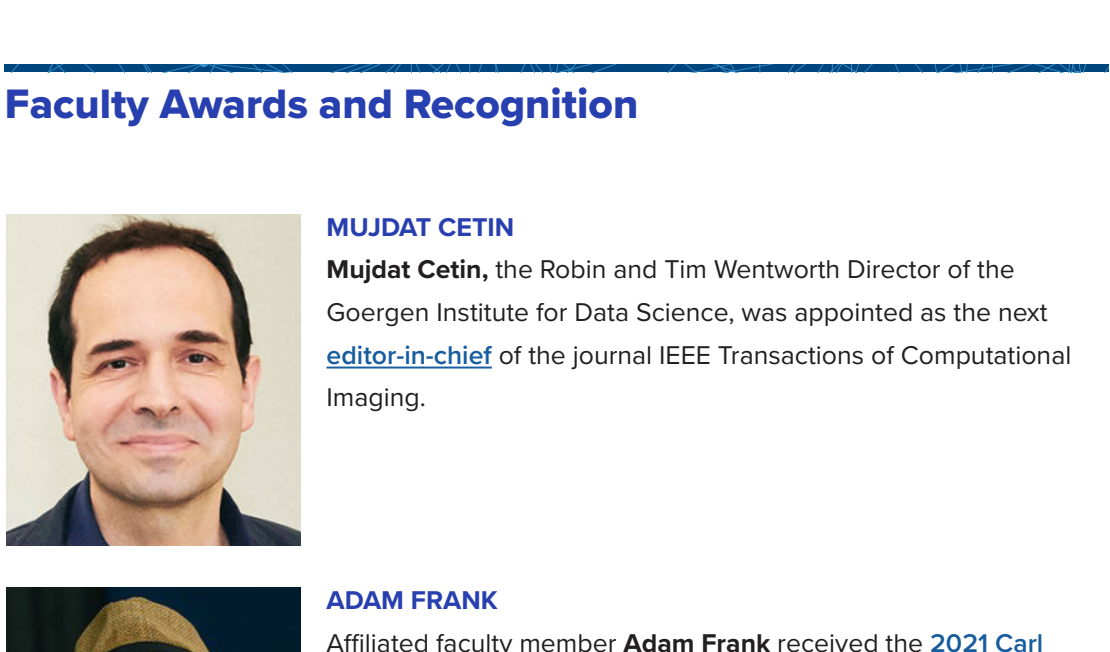
[New computer vision software](#), designed by GIDS-affiliated faculty member and former interim director **Ensan Hoque** and his research team, can predict whether a person is likely to develop Parkinson's disease by analyzing subtle facial muscle movements in selfies and short videos. The new software has the same reliability as expensive, digital biomarkers that monitor Parkinson's symptoms, and Hoque has received funding from the Gordon and Betty Moore Foundation for further development. Hoque also collaborated with affiliated faculty member Ray Dorsey to design a five-pronged Parkinson's test that can be administered virtually; the test utilizes machine learning algorithms to generate the likelihood of a patient showing symptoms of Parkinson's disease within minutes.



Protein partner graphic

Research Spotlight: 'Protein Partner' Disruptions Could Contribute to COVID-19 Symptoms

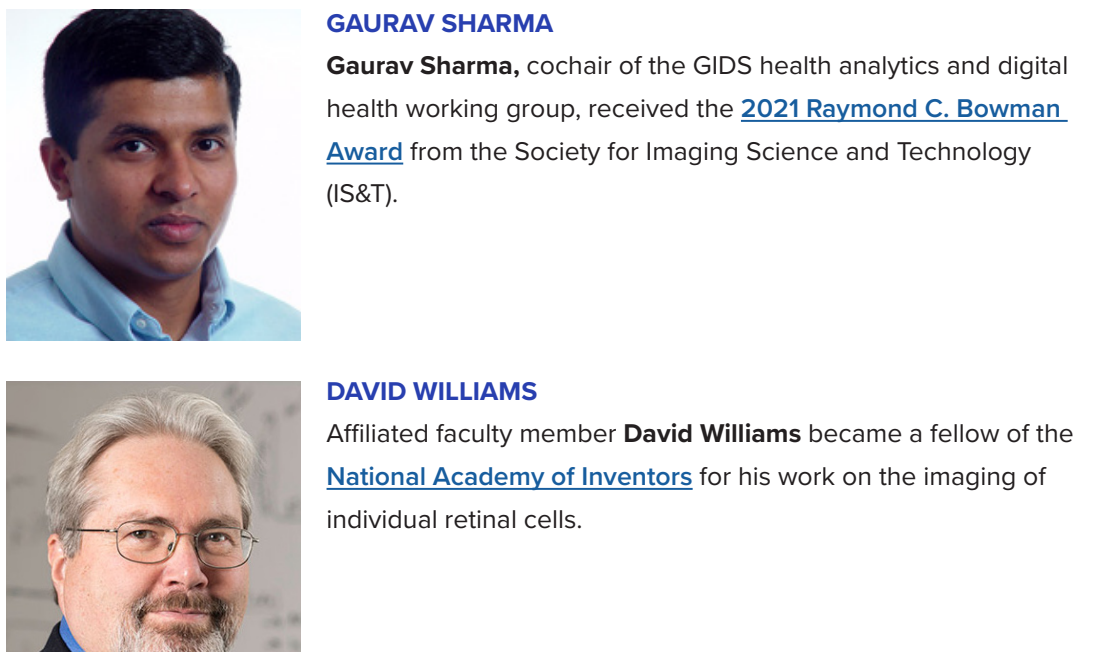
[New research](#) found that disruptions caused by COVID-19 in the normal functions of the Angiotensin-converting enzyme 2 (ACE2) and co-evolving proteins could contribute to the spectrum of COVID pathologies.



Peter Daszak

How Can We Analyze Pandemics to Predict and Prevent the Next One

On Friday, November 19, GIDS welcomed **Peter Daszak**, president of EcoHealth Alliance and a key COVID-19 researcher, to the Wegmans Hall auditorium. In his research talk, [How Can We Analyze Pandemics to Predict and Prevent the Next One](#), Daszak discussed the zoonotic origins of coronaviruses and strategies for forecasting, preempting, and disrupting pandemics at their source.



Cantay Caliskan

Faculty Spotlight: Cantay Caliskan, Assistant Professor of Instruction in Data Science

Over the summer GIDS welcomed new faculty member [Cantay Caliskan](#) to our team. During the fall semester Caliskan taught DSCC 483, Data Science Capstone and Practicum, and DSCC 240-1, Data Mining. GIDS caught up with Caliskan to discuss his new role as an assistant professor of instruction in data science.

Q: What do you enjoy about teaching data science courses and students?

A: Data science is still an emerging field, and the intensity and scope of data scientific applications is still growing. This aspect makes the classroom experience much more enjoyable compared to more settled fields of study. I enjoy the fact that teaching is not a one-way communication where the professor provides a set of learning media to students for them to digest. My view of teaching is more of a "generational exchange," and I enjoy listening to students' questions, their academic interests, and the knowledge they have acquired in their lives.

In data science specifically, we have the opportunity to connect current developments in the field to the classroom, showing our students that their hard work can translate into something "cool" and "good-looking." I like showing videos, applications, statistics, and visuals from the world of data science in the classroom, and I find those moments to be the most enjoyable. The youth in our field make lectures more dynamic and colorful; theoretical discussions of data science are enriched quite beautifully by conversations about what "techgirls" and "techboys" have done in Silicon Valley, what Google engineers do with 20 percent of their time, how fake news dominates our current social media experience, and what the next technology catalyzer will be.

Q: What are you looking forward to working on in your role at GIDS in the future?

A: Technology is becoming more accessible, taking new (and unexpected) forms every day, and—perhaps more importantly—bringing in more scientists from seemingly irrelevant disciplines to work together on common goals. One of my goals is to introduce some of these changes, or the intensification of some of these aspects of the field, to the classroom setting. Although college teaching has changed immensely over the last few decades, I believe there is still room for teaching to evolve. In the near future, I hope to enrich students' experiences by presenting new data collection methods and introducing projects that involve augmented and virtual reality. I also hope to make GIDS even more interdisciplinary by building new bridges between the Institute and top faculty in other departments.

Capturing images of a book

New Imaging System "Reads" Books without Opening Them

[A new imaging system](#), designed by GIDS-affiliated faculty member **Gregory Heyworth**, can generate digital images of rare and fragile manuscripts and books without opening them more than 30 degrees. The system utilizes a twistable view camera to take pictures of the inside of each book from above. Researchers then correct the pictures geometrically before using multispectral imaging to color correct and to detect text that is difficult or impossible for the human eye to see.

James Allen

James F. Allen Retirement Celebration

On Friday, December 10, GIDS joined the Department of Computer Science in [celebrating the career and achievements](#) of Professor **James F. Allen**, the John H. Dessauer Professor of Computer Science and a GIDS-affiliated faculty member. Allen retired after more than 43 years at the University and was celebrated with addresses from colleagues and former students, including GIDS founding director **Henry Kautz** and GIDS External Advisory Committee member **Diane Litman**. Congratulations to Professor Allen on a long, successful career and best wishes for a well-earned retirement.

Student Achievements

Alumnus **Haosong Zheng '21, '22S (MS)**, now a master's in business analytics candidate at the Simon Business School, received admission to the prestigious [Schwarzman Scholars program](#). The program, established by investor and philanthropist Stephen Schwarzman, prepares future leaders by offering students an immersive experience within an international community of thinkers and leaders in business, politics, and society in China.

GIDS alumni **Senqi Zhang '21**, **Li Sun '21**, **Daiwei Zhang '21**, **Pin Li '21 (MS)**, and **Yue Liu '21** published a paper based on their final semester capstone project in [medRxiv](#). The paper examines COVID-19 and mental health concerns on Twitter.

Faculty Awards and Recognition

MUJDAT CETIN
Mujdat Cetin, the Robin and Tim Wentworth Director of the Goergen Institute for Data Science, was appointed as the next [editor-in-chief](#) of the journal *IEEE Transactions of Computational Imaging*.

ADAM FRANK
Affiliated faculty member **Adam Frank** received the [2021 Carl Sagan Medal](#) for excellence in public communication in planetary science from the Division for Planetary Sciences (DPS) of the American Astronomical Society.

JIEBO LUO
Jiebo Luo, co-chair of the GIDS foundations of machine learning and artificial intelligence working group, received the [2021 Award for Outstanding Technical Contributions to Multimedia Computing, Communications and Applications](#) from the Association for Computing Machinery (ACM) Special Interest Group on Multimedia (SIGMM).

GONZALO MATEOS
Gonzalo Mateos, an Asaro Biggar Family Fellow in Data Science and the co-chair of the GIDS foundations of machine learning and artificial intelligence working group, received the [2021 IEEE Signal Processing Society \(SPS\) Pierre-Simon Laplace Early Career Technical Achievement Award](#) for contributions to distributed, online, and robust signal processing networks.

GAURAV SHARMA
Gaurav Sharma, co-chair of the GIDS health analytics and digital health working group, received the [2021 Raymond C. Bowman Award](#) from the Society for Imaging Science and Technology (IS&T).

DAVID WILLIAMS
Affiliated faculty member **David Williams** became a fellow of the [National Academy of Inventors](#) for his work on the imaging of individual retinal cells.

CHENLIANG XU
Affiliated faculty member **Chenliang Xu** received a [James P. Wilmot Distinguished Assistant Professorship](#).

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