Greetings to all of our URCS alumni and friends! I am excited to be entering the second year of my term as department chair. The first year has certainly been different from what I once expected. We’ll see how the second turns out!

Starting halfway through the spring of 2020, we’ve now spent almost three semesters interacting primarily in the virtual world. Our staff learned to work from home. Faculty members held lectures (and exams!) online. Researchers with physical labs and human subjects overcame significant challenges to keep their projects going. All of our seminars and conferences moved online as well. Many of us “attended” more conferences than we usually do but, typically, enjoyed them less. The Grace Hopper Celebration (GHC), to which we usually send more than two dozen students each year, was a notable case in point.

This fall we hope to see a partial return to some sort of pre-COVID “normal.” As I write this, the University is planning to hold classes mostly in person at full classroom density but with everyone still masked. Our seminar series is also returning to an in-person audience, though some of attendees (and speakers!) may still be remote. Members of the department staff are back in the office three days a week. But most fall conferences (including GHC) are still planning to run online-only, and all of this could change in an instant if the Delta variant continues to surge and significant numbers of people continue to resist vaccination.

On the plus side, we’ve all learned to make effective use of teleconferencing technology, and this is likely to be a long-term benefit, making it easier to collaborate at a distance and helping to reduce the cost and carbon footprint of unnecessary travel. Our seminar series was able to recruit several speakers who would not normally have been able to travel to Rochester, and we’ll probably continue to include such people remotely in the future. Some of us (myself among them) recorded the lectures for our courses, allowing us to “flip” the classroom going forward (ask me in January how that went :-).

Despite all the challenges of COVID, we graduated 37 BA, 87 BS, 21 MS, and 9 PhD students this year (with real, in-person ceremonies!) and we’ve admitted talented incoming classes at all levels. There are a host of new projects under way, with new external funding. And there are exciting internal initiatives as well. Ehsan Hoque is pioneering a new course on Technology and Climate Change (see article on page 10). Brian Kimani and Hanjie Lyu are two of several students collaborating with University Facilities on institutional sustainability.

This has also been a year of career and life transitions. James Allen, the department’s longest-serving faculty member, retired in July of 2021 (see article on page 4). James Roche, our lab manager, is retiring in October after more than 35 years with the department (see article on page 4). Muthu Venkitasubramaniam, after a decade in the department, accepted a faculty position at Georgetown University in order to solve a “two body problem.” We also received word that Jill Orioli Forster, long-time department administrator and “mother hen” to generations of graduate students, died in November of 2020.

In the wake of Randal Nelson’s unexpected death in March of 2020, the department worked with University Advancement to launch the Randal Nelson Graduate Student Fund. To date we have raised more than $30,000, which will help to meet the needs of future generations of students. (See the box on the facing page to contribute.)

As we went to press last year, the department had just hired Elaina McKie as undergraduate coordinator. This past spring, we were delighted to hire Kaave Hosseini (PhD, UCSD 2019; postdoc, CMU) for a tenure-track position in the theory group (see article on page 7). We were similarly delighted, more recently, to recruit Anson Kahng (PhD, CMU 2021) for a joint position between CS and Data Science, starting in 2022. We will be looking to fill two new tenure-track and one instructional position this coming year.

The list of recent faculty, staff, and student awards is too long to include here in its entirety. Within the University, Eileen Pullara received the Witmer Award for Distinguished Service (see article on page 5); Chenliang Xu was awarded a Wilmot...
Junior Professorship; Chen Ding received the College Award for Undergraduate Teaching and Research Mentorship; and the CS Undergraduate Council received the Excellence in Programming award “for its exceptional creativity, planning, and execution of programs that appeal to a broad cross-section of the University community.”

In the larger sphere, James Allen was named a fellow of the AAAS, Yuhao Zhu received an NSF CAREER award (see article on page 6), and at least four student-led teams took Best Paper awards at various conferences. See some of this year’s student accolades listed on page 5.

As we celebrate our past successes, remember those who have moved on, and look to an exciting if uncertain future, I wish all our readers a safe and productive year. Keep in touch. Come visit when you can. Let me know your hopes for the department.

Yours,

Michael

To Honor Professor Randal Nelson

To honor Professor Randal Nelson, who passed away suddenly in April 2020, we have established the Randal Nelson Graduate Student Fund. This fund will provide support for graduate students in the Department of Computer Science for needs such as research funding, academic fellowships, and conference attendance costs. Nelson’s legacy will live on through this fund, and we are truly grateful for your thoughtful support in his memory. Donations in Randal’s honor can be made at http://uofr.us/nelson.
James Allen, Professor, Retires after More Than 40 Years with URCS

James Allen joined the Computer Science Department at Rochester as its fifth faculty member in 1978, after receiving his PhD from the University of Toronto. His early work focused on the development of a plan-based theory of speech acts, which still serves as one of the more influential computational models of dialogue behavior developed to date. To further the development of this model, he focused on formal underpinnings and wrote two landmark papers, each with more than 15,000 citations, on action and time: “Maintaining Knowledge About Temporal Intervals” and “Towards a General Theory of Action and Time” published in the Communications of the ACM in 1983 and in the journal Artificial Intelligence in 1984, respectively. In 1984, he was one of the first recipients of the Presidential Young Investigator Award from the National Science Foundation. His research has always focused on exploring the connection between language understanding and knowledge reasoning, especially in natural language conversational systems. In recent times, he has focused on models of dialogue in human collaborative problem solving.

In 1983, Allen became the editor-in-chief of the American Journal of Computational Linguistics (now called Computational Linguistics). The journal flourished and grew to be the leading publication venue in the area by the time his term ended in 1993. He became chair of the department in 1987, the same year he was promoted to full professor. In 1992, he was named the John H. Dessauer Professor of Computer Science, acquiring the endowed chair originally held by Jerry Feldman, the founder of the department. Allen was director of the Cognitive Science Program from 1992 to 1996 and the co-director of the new Center for the Sciences of Language from 1996 to 1998. From 1999 to 2002, he served on the National Science Foundation’s Advisory committees for both the Computer and Information Science Directorate and the Environmental Research and Education Directorate.

In 1997, Allen won the University’s Curtis Award for Excellence in Graduate Teaching. Over the course of his career, he supervised 34 PhDs, spanning from his first student who graduated in 1981 to his final two students in 2020. Two of Allen’s former advisees, Henry Kautz and George Ferguson, are currently faculty at Rochester.

Allen was elected a Charter Fellow of the AAAI in 1990, a Fellow of the Cognitive Science Society in 1999, and a Fellow of the American Association for the Advancement of Science (AAAS) in 2020. He received the Herbert A Simon Award for Lifetime Achievement in Cognitive Systems in 2020.

Starting in 2002, Allen split his time between Rochester and the Institute for Human and Machine Cognition in Pensacola, Florida, where he served as a senior research scientist and (starting in 2006) as associate director. This led to a long series of collaborations between the two institutions funded by large research grants from DARPA and other agencies.

Looking forward, Allen is planning to devote his time to sustainable agriculture, developing a regenerative farm just a few miles south of Rochester.

Jim Roche, Lab Manager, Retires after 35 Years with URCS

Jim Roche has been a prominent figure within the department since he joined in 1986. Prior to URCS, he worked a few years at Computer Consoles (located in Rochester) developing software for the telephone industry shortly after his graduation from Rochester Institute of Technology.

Roche recalls, “when I joined the department, we were still primarily working on 5 VAX computers via ASCII terminals, and we were located on the third, fifth, and sixth floors of Hylan Hall as well as the basement of Morey Hall. Then, in 1987, we moved to the sixth and seventh floors of the [then] new Computer Studies Building and began the migration to SUN workstations. At that time, only one workstation was provided to each student office, which was shared among three to four students, and the software lab housed several additional workstations for student use. In those days, Labcomm meetings often consisted of discussions regarding whether to spend another $5,000 to get an additional 800 MB disk for the server.” More recently, Roche helped move all the computer equipment (central computers and servers) once again when the department moved for a second time to the newly constructed Wegmans Hall in 2017.

Together with senior programmer Dave Costello, Roche has provided outstanding service to the department. Between moves, server crashers, COVID-19, and other such disasters, there has always been minimal interruption to the functioning of the department.

During retirement, Roche is most looking forward to spending more time with his four grandchildren—all of whom live within 10 miles—and doing some world travel with his wife, Melanie. He is also hoping to become more active in his hobbies, such crafting furniture in his woodshop and training and racing in duathlons.
The University’s Witmer Award for Distinguished Service is presented to staff members whose careers have made outstanding and sustained contributions to the University, and, for nearly 50 years, Eileen Pullara’s career has done just that. Since joining the University in 1971, Pullara has been a dedicated employee, most notably in her current role as only the second administrator in the Department of Computer Science, a position she has held since 2003.

Pullara has played a central role in numerous projects and transitions within the department, including balancing budgets commensurate with the department’s growth, assisting in training colleagues University-wide in new financial and human resource management systems, and serving as the department’s United Way coordinator. She has also mentored countless colleagues as part of the River Campus Administrators’ Group and is “often sought to be on University committees because of her breadth of understanding of how the University works in areas of research, reporting, and department administration,” writes Sondra Anderson, the interim associate director of finance for University Health Service, in a letter of support.

In 2013, Pullara was awarded the Edmund A. Hajim Outstanding Staff Member of the Year honor. “Her level of caring and attention to detail truly go above and beyond,” noted Sandhya Dwarkadas, the Albert Arendt Hopeman Professor of Engineering, in a nomination letter.

Consistently praised by her peers and colleagues for her collaborative spirit, sense of humor, dedication, and hard work, Pullara assisted the department through three transitions of department chairs—plus two interim terms. In 2013, she played a key role in the launch of the Goergen Institute for Data Science, assisting its director with grant administration, finance, and new staff hiring. Over the last several years, the Department of Computer Science has witnessed unprecedented growth—nearly tripling its undergraduate population and doubling its graduate enrollments since 2014. “Eileen showed untiring resolve, grit, and unwavering purpose to meet the administrative challenges such transformative change and rapid growth engendered,” write the Hajim School’s Wendi Heinzelman, dean; Cindy Gary, assistant dean of grants and contracts; and Tim Woodward, director of finance and administration.

Michael Scott, the Arthur Gould Yates Professor and Chair of the Department of Computer Science, writes, “Her ethos of caring and inclusion has been particularly precious over the course of the COVID pandemic. It was Eileen who figured out how to implement our required furloughs with minimal impact on staff member lives and finances; who balanced hours, workloads, and schedules to accommodate childcare and elder care challenges; who arranged to keep the department open while keeping everyone safe.”
Professor Yuhao Zhu Receives the National Science Foundation’s CAREER Award

Yuhao Zhu, assistant professor of computer science, recently received the Faculty Early Career Development (CAREER) Award from the National Science Foundation (NSF). This prestigious award supports outstanding early-career faculty in building a firm foundation for a lifetime of leadership in integrating education and research. The award is accompanied by five years of funding that will allow Zhu to further grow his already successful research and education program.

Zhu’s CAREER project addresses the very important problem of designing software and hardware mechanisms to increase the performance and energy efficiency of smaller and smaller transistorized chips. Such chips can be clustered with a wide variety of specialized hardware components, known as accelerators, that can improve the performance of key applications by 10–100x. For example, the video codec is a hardware accelerator that exists in virtually every smartphone today, compressing and decompressing videos in real time, without the user ever noticing.

A modern computer may have to integrate dozens, if not hundreds, of such accelerators. For instance, an augmented reality application simultaneously exercises at least five different accelerators. This poses a major challenge. How do we coordinate these accelerators so that we can translate the orders of magnitude efficiency gains of individual accelerators to the end-to-end application?

Zhu explains, “This project breaks away from conventional research on individual accelerators. The key intellectual merit is the pursuit of mechanisms that globally optimize across accelerators.” The technical approach in this project is two pronged: 1) design mechanisms that approach the upper bound of acceleration by reducing the overhead of accelerator interaction, including inter-accelerator data communication and task coordination; and 2) design systems that go beyond pure acceleration to enable algorithms that share metadata across accelerators.

“The research project aims to develop programming interfaces and compiler support that expose data flow, task flow, and metadata sharing opportunities across accelerators,” Zhu writes.

Zhu looks forward to including findings of the funded project in his graduate course, CSC 572 Mobile Vision Computing, to help him better train young engineers and scientists on how to identify and solve real-world problems through a software-hardware codesign. He is also excited to continue this work via the University’s Upward Bound Math and Science program, where he will teach an introductory programming course to high school students from primarily low-income families. The course will be taught using Raspberry Pi devices to showcase the power of tiny computers and will consist of three modules: 1) introduction to programming, 2) simple image-processing algorithms such as edge detection and image blurring, and 3) simple digital logic circuits on FPGAs. Recorded lectures will be made available to students unable to attend the course in person as well as to the general public.
Kaave Hosseini joined the Department of Computer Science as an assistant professor in Fall 2021. Hosseini received his PhD in Computer Science from the University of California San Diego in 2019 and was a postdoctoral associate in the Department of Mathematical Sciences at Carnegie Mellon University before joining URCS.

Hosseini’s research is in the area of theoretical computer science and discrete mathematics. Part of his research is on the theory and applications of an approximate analog of linear algebra to problems that arise in different areas of theoretical computer science. Linear algebraic objects (such as matrices) are ubiquitous in computer science, but oftentimes get corrupted in the presence of noise and, as a result, they degenerate to only approximately linear. It is crucial to be able to both classify such approximately linear objects and correct them back to their original linear form. A surprisingly high number of concrete problems in computer science can be phrased in this language of approximate linearity. Some of these problems (which may seem quite unrelated on the surface) are as follows: Can data be stored in a way that when corrupted it can be detected and restored quickly? To what extent can we check the soundness of a computer program by using only a few random test cases? How can a device with limited memory (like an internet router) perform a task on a stream of massive incoming data very fast and on the go? How can computational devices jointly perform a given task with minimized communication among them? Hosseini has developed some novel techniques in the framework of approximate linear algebra and used it to answer versions of these problems. Hosseini also works on another related line of research which studies the power of having access to randomness when performing computational tasks. It is well known that some tasks can be performed efficiently if the computer algorithm has access to random bits (such algorithms are called randomized algorithms). A fundamental open problem speculates that there should be a deterministic algorithm for any problem that can be solved with a randomized algorithm. However, to date, no such fast deterministic algorithms are known. The partial progress made so far towards this “meta problem” has been via construction of pseudorandom generators, that is, algorithms that generate a deterministic sequence of numbers that “appear” to be random. Designing pseudorandom generators has been a very active line of research over the past decades, with hundreds of papers published in the area. Hosseini and his coauthors have developed a novel framework to construct pseudorandom generators that circumvents many limitations of previous approaches and simultaneously unifies and improves upon many results in the literature.

This fall semester, Hosseini is teaching his newly designed course, Analytic Methods in Computer Science. The course focuses on tools from mathematical analysis and linear algebra and applies them to problems in a variety of areas, including clustering, coding theory, randomized algorithms, machine learning, social choice theory, streaming algorithms, and complexity theory. Even though most of the problems that arise in these areas are discrete and combinatorial in nature, researchers have come to realize that it is fruitful to treat these problems as continuous (through an analytic lens) rather than discrete. Originally developed to understand some problems in physics, this approach has had impressive success in solving problems in physics, mathematics, and, more recently, computer science. Hosseini hopes to continue expanding and teaching such courses, to make analytical tools more well known among computer science graduate students and interested undergraduates so that they can use them to identify and model problems in their own domains.
Piotr Faliszewski is a professor of computer science at AGH University of Science and Technology in Krakow, Poland. Faliszewski was awarded his PhD degree in computer science from the University of Rochester in 2009, writing his PhD thesis on “Manipulation of Elections: Algorithms and Infeasibility Results.” His BS and MS degrees in computer science are from AGH University of Science and Technology.

Faliszewski’s research centers on computational social choice theory, broadly construed. He is an internationally recognized leader of the field, both in his research and through his organizational contributions to workshops, conferences, and journals. He has received Polityka news magazine’s Research Prize in technical sciences and was awarded the Friedrich Wilhelm Bessel Research Award of the Alexander von Humboldt Foundation.

For this issue, Faliszewski was interviewed by Professor Lane A. Hemaspaandra, his thesis advisor.

Let’s start big. What is computational social choice theory? What drew you to it? Why is it important to study?

How will it change and improve the world? You recently received—warmest congratulations—a 1.4-million-euro, five-year ERC (the EU’s European Research Council) Consolidator grant: What will its key directions be, and how will such a large amount of support help you and your group advance the field?

Oh, that’s a lot of questions to start with! But first things first: In short, computational social choice is an area that, on the one hand, tries to use computer science techniques to solve problems of group decision making, and, on the other hand, tries to apply these decision-making approaches within computer science. As one example, consider the problem of finding a movie that would, in some way, be related to another one. For example, if you liked some slapstick comedy, you might want to find similar ones. One approach is to collect information about the movies that people who enjoyed your comedy also liked and treat them as votes in an election. Then, depending on the voting rule you decide to use, you might either get very similar movies, such as sequels to the comedy or movies from the same makers, or, with a different voting rule, you might get movies that are related in more subtle ways. However, computing the results of these voting rules may be computationally difficult, e.g., it may be NP-hard. Thus, we need various algorithmic tools to deal with such intractable problems. Further, to know what types of relations different voting rules would identify, we need to study these rules’ properties.

But, of course, computational social choice has many more things to offer. In my project we will focus on two main issues. The first one is to develop algorithmic tools for running advanced elections that would help people and institutions make better decisions. For example, our algorithms would help institutions choose groups of people for particular tasks, would help cities run their participatory budgeting schemes or—as indicated—would help friends choose movies to watch. The second issue is more introspective: Our field started up as a mostly theoretical one, but nowadays there is plenty of experimental work. Our goal is to lay out theoretical foundations for how experiments should be conducted so that their results give some true insights. For example, if you are to test your algorithm experimentally, what data should you consider? Should you collect real-life data, or would synthetic data be more appropriate?
direction, and likely to make an impact is research is meaningful, going in the right study?" The best way to ensure that your study the particular problems that you simply, a researcher—faces is "why do you questions that a young researcher—or, Perhaps one of the most difficult important new directions, drawing on how to, as you have done, create promising directions early on, or even their areas are—as to how to identify attacking elections; the study of multiwinner elections; and defining and understanding a “Map of Elections” and using that to better ground experimental studies. Also, in your work, you employ a remarkably rich range of tools, ranging from multiple types of complexity to algorithms to optimization to experimentation. What advice would you give younger researchers—whatever their areas are—as to how to identify promising directions early on, or even how to, as you have done, create important new directions, drawing on a varied palette of techniques?

Your research has been extremely fresh, creative, and influential across a very wide range of themes. To mention just a handful: the effects of various types of restricted domains on the difficulty of attacking elections; introducing new models of electoral attacks; the study of multiwinner elections; and defining and understanding a “Map of Elections” and using that to better ground experimental studies. Also, in your work, you employ a remarkably rich range of tools, ranging from multiple types of complexity to algorithms to optimization to experimentation. What advice would you give younger researchers—whatever their areas are—as to how to identify promising directions early on, or even how to, as you have done, create important new directions, drawing on a varied palette of techniques?

Perhaps one of the most difficult questions that a young researcher—or, simply, a researcher—faces is “why do you study the particular problems that you study?” The best way to ensure that your research is meaningful, going in the right direction, and likely to make an impact is to make sure that you can always answer this question. When I was very early in my career, during graduate school or even before, all I wanted to do was to prove things, establish new results, and show something that I could publish. Doing so is a nice kind of sport that one needs to learn as a researcher, and if one is really good at it, then one can turn it into a successful career. Yet, if one wants to be a true leader, one must be able to conjure dreams and show credible paths that go from the problems one is currently solving to fulfilling these dreams. These paths may not always work out. Indeed, often they do not, but they offer guidance, and they keep us on track. By the time we find that our original plans were not as realistic as we might have hoped, we usually see a myriad of ways to sidestep the difficulties and to go on. So, in other words, if you are a researcher working on some topic, you better be able to explain why, and you better be convincing! Of course, your answer will likely evolve over time. Indeed, you should be willing to question it and rethink it. But if you do have the answer, then all the other issues are secondary. Your illustrations for your papers are spectacular, utterly unmistakable, and both detailed and exuberant. We have included on this page an example that you kindly provided. How did you develop your artistic style, and how much time does it take to plan and execute such an illustration?

Actually, it is all your fault! As my advisor, you once gave me a presentation to prepare based on a handwritten draft. I tried following this draft, but there were numerous pictures with various characters appearing, and I somehow had to insert them into the presentation. Unfortunately, I could not find satisfying pictures anywhere. So, on the spur of the moment, I simply drew them by hand, scanned them in, and colored them with some basic graphics program. It all just took a few minutes, and I had nice characters for the presentation. The effect was so appealing that, somehow without me really aiming for it, it became the standard way for me to make presentations. Regarding the style, there is nothing to it—I simply cannot draw anything else. My pictures look the way they do because I literally cannot draw anything else! I can’t even draw the same character twice!

You came to URCS from AGH University of Science and Technology and then returned there as a faculty member. How did you choose URCS? How did you come to return to AGH afterward? What was it like returning to the beloved department where one was trained but as a colleague to one’s former professors?

Oh, it feels like much more than forever! I sometimes joke that I’m currently living my third life. The first one was before URCS, the second happened in the United States, and the third one is now. Indeed, I wonder what the fourth one will look like! Regarding final thoughts for today’s PhD students, all I can say is to not worry too much. While graduate school can be tough, frustration can creep in, and the prospects of seeking a job can be scary, there is also a lot of fun to be had. So, simply do your job well and make sure to enjoy yourself while you do it. I would probably have put here some motivational quote, if I could think of one quickly enough, but maybe let’s finish it at this! Your fault again! At least for URCS! During my BS/MS program (in Poland these used to be joint five-year programs, so anyone who wanted to get a university degree
During the ice age—2.4 to 2.1 billion years ago—the average temperature was only six degrees Celsius lower than today. During the era of dinosaurs—245 and 66 million years ago—the average temperature was just four degrees higher than today. If we don’t do anything about climate change, the earth’s average temperature is projected to rise by four degrees by 2100. Global temperature rise will raise global mortality, marking climate change as deadly as COVID by 2050. By 2100, it would be five times deadlier.

We typically add 51 billion tons of greenhouse gases to the atmosphere every year. To stop global warming and to avoid its worst effects, we need to lower it to 0. It is the biggest challenge we face today. Pretty much everything we do involves releasing greenhouse gases. The solution will require a fundamental shift in how we live.

The world has never solved anything quite so significant yet, and breakthroughs are necessary for zero-carbon energy and for reducing net emission to zero.

Now what does this have to do with computer science? A brand-new class called Technology and Climate Change has been designed precisely to address this question.

Before explaining what is covered in this class, it is perhaps worth noting what is not covered. This class is not about applying data mining techniques to climate datasets and generating happy graphs. Instead, this class introduces how humans change the climate and how our lifestyles contribute to air and water pollution, changing land and wildlife and threatening coastal life. The class is structured around three fundamental strategies: 1) Mitigation, 2) Adaptation, 3) Prediction.

**Mitigation**

One of the fundamentals of computer science is learning how to measure the complexities of algorithms. A recent wave of research also calls for evaluating the carbon footprint of an algorithm/platform to the environment. For example, training a single AI model can emit as much carbon as five cars in their lifetime (Strubell, Ganesh, McCallum, 2019). In this class, students learn to use cost, CPU, and RAM consumption (particularly in the cloud) as a proxy to define operational boundaries to minimize any unintended consequence to the environment. Students are also exposed to “Green AI” (redefining efficiency by reporting the number of floating-point operations to generate results) and “Red AI” (maximizing...
accuracy by deploying massive computational power leading to a larger carbon footprint). As computer scientists, we can learn to contribute to equity and access, leading to a greener world.

Adaptation
There is a significant opportunity for AI to aid people with the adversity of climate change. This is particularly important for countries that have many victims of climate change but that don’t have the resources to address that change. The course introduces the important topic of climate justice—a movement that acknowledges that climate change often has disproportionate effects on historically marginalized or underserved communities. There is also an opportunity to use AR/VR technologies to create awareness and educate people about climate change.

Prediction
Computation can play a significant role in our response to climate change, from predicting extreme weather to figuring out the optimal eco-friendly route to a destination. Applying remote sensing to automatically determine suspicious changes in biodiversity will be critical to preventing the next pandemic.

discussion in the class is grounded in ethics. Very few companies have incentives to disclose their carbon footprints. As CS graduates are hired by many of those companies and eventually take on leadership positions, they need to have the knowledge, awareness, and ethical rigor to impose transparency and promote sustainability.

Another unique aspect of the course is an emphasis on the impact of climate on human health and well-being. This emphasis allows the class to benefit from much of the existing research at URMC and could potentially help us start a new research program on climate computing. We hope this class will be an example of classroom instruction inspiring new research activities, much as our research activities constantly influence our teaching.

Social Choice continued from pg. 9

had to go for an MS, I got very interested in computational complexity theory. The courses I took were not challenging enough, and I started getting “Western” books on the topic. While they were not very easy to obtain, I got my hands on a few, including The Complexity Theory Companion by you and Ogihara. I read it, and since you made the mistake of encouraging people to send you typos and comments on the content, I sent you mine. The response I got was, “Great! Come do a PhD with me!” (Possibly not in exactly those words but pretty close to them). And that was it: I did not look for any other advisor or school—I applied to URCS, got in, and got a PhD with you!

Regarding the return to AGH, I stayed in touch with my MSc advisor (indeed, I still see him regularly), and each time I visited home I would also meet with him. It turned out that he was retiring just when I was about to graduate, and he suggested that I return. I thought, “Why not?” I decided that I would see whether I could make a happy life back in Poland, but under my own conditions—making a living by doing science. It turned out to be possible, and here I am!

As to what it’s like working at the place where I got my training, that’s a tricky question. I no longer really remember how it was before I became a faculty member! All I can say is that I was lucky that I started working at AGH shortly before the department moved to a new building. As we moved, a lot of new friendships were formed because everyone was put under new conditions. It was a fun time, making a living by doing science...

You graduated from URCS a dozen years ago. Does it seem like yesterday or forever? And do you have any final thoughts or suggestions that you’d like to share with today’s URCS PhD students to help them as they undertake their thesis research and then embark on careers in academia and industry?

Oh, it feels like much more than forever! I sometimes joke that I’m currently living my third life. The first one was before URCS, the second happened in the United States, and the third one is now. Indeed, I wonder what the fourth one will look like! Regarding final thoughts for today’s PhD students, all I can say is to not worry too much. While graduate school can be tough, frustration can creep in, and the prospects of seeking a job can be scary, there is also a lot of fun to be had. So, simply do your job well and make sure to enjoy yourself while you do it. I would probably have put here some motivational quote, if I could think of one quickly enough, but maybe let’s finish it at this!
Joseph Bryan Lyles (MS ’77)

I recently retired from Oak Ridge National Lab at the end of May, where I had been working on issues associated with security of critical infrastructures. I’ll continue to stay involved with the technical community but not as a regular employee.

Michele Denber (MS ’80)

I joined a project last year started by the original developers of Interlisp-D at PARC to modernize the language. You can now run it on a variety of computers, including Suns, IBM PCs, and Macs. Interlisp-D was and remains an unbeatable tool for rapid prototyping. I’m also getting the original Interlisp 10 running again on a PDP-10 emulator on my Sun. For more information see https://interlisp.org/. I’m also restoring a 1958 BRAINIAC, the first personal computer toy ever made (https://en.wikipedia.org/wiki/Geniac). Technically, it’s more a state machine than an entire computer as it lacks any RAM, clock, or automatic switching ability, but with hand-wired circuits, six rotary switch discs for manual input, and 10 flashlight bulbs for output, it can do combinatorial logic. It became fairly popular in the 1950s and was the first introduction to computers for many kids, even making it to the pages of Superman by 1964.

Pictured above, right, is my BRAINIAC, the oldest computer in my collection, long before the Alto or the PDP-10. Three of the discs have been removed to show the concentric rows of contact points. Wipers on the discs make circuit connections when the discs are rotated, causing various bulbs to illuminate according to the problem defined by the wiring in back.

Jay and Susan (Hollbach) Weber (PhD ’89)

We now have one grandchild and another on the way! We also have recently moved from Palo Alto, California, to Cape Cod, Massachusetts.

Alice Kyburg (PhD ’94)

I live on Martha’s Vineyard with my husband, Brad Abbott, and twins Henry and Amelia, who are now high school juniors. My husband is a partner at Gannon & Benjamin Marine Railway, Inc., where they build and restore wooden sailboats. We live aboard our recently restored schooner Calabash during our summers. Please drop by and say hello! I retired from the University of Wisconsin Oshkosh Department of Philosophy two years ago, and I now run a tutoring center. I am also participating in an online collaborative degree program through the University of Wisconsin that offers a master’s in data science. I teach the Ethics of Big Data. I’m enjoying following the development of CS research into ethical algorithms. If you have any relevant material or experiences, please be in touch! I’m also in the final phase of establishing the Henry Kyburg Fund, honoring my father, Henry Kyburg Jr., which will be funding interdisciplinary research and programs at the UR, with preference given to data science, cognitive science, computer science, philosophy, and neuroscience. Please consider a contribution to help us reach that required minimum we are so very close to. You can contact me or Jenna Hiller (jenna.hiller@rochester.edu) at the UR Alumni office or donate directly through the UR alumni website (www.rochester.edu/alumni/); specify “Henry Kyburg Fund.”

Jim Muller (MS ’94)

After 15 years at Google, I left last year to found Didero. We use controllable AI to make recommendations in areas where personal preferences are a big deal, starting with books and TV shows. Didero also focuses on helping people find something to read or watch for a group, whether it’s a show for the family to watch together, an audio book to listen to together in the car, or a book for a book club. Didero is fully remote, which was an opportunity for my wife and me
to move to the Olympic Peninsula, where we now live on Discovery Bay.

**Massimo Poesio (PhD ’94)**
This past year hasn’t been great for international travel. It is the first time since I left Italy in 1987 that I didn’t go back to see my family after the ski trip in Val d’Aosta (illustrated in the photo), but I’ve been to Germany a couple of times, and we’ve been traveling within the UK (Scotland, the Lake District, etc.). My son Joshua (picture left) is now in the second year of secondary school and enjoying it, mostly. I have published a bunch of papers, as usual, and finished a new book with Morgan Claypool that will come out later this year. Nothing too unusual, except perhaps a lot more cooking than I normally would do.

**Galen Hunt (PhD ’98)**
My 18-year-old son, Weston, and I took up flying during the COVID-19 lockdown. He got his license before me, but the old man scored higher on the written exam.

**Amit Singhal (PhD ’01)**
Last year brought some significant changes. I completed my JD degree, passed the bar exam, and became a partner at Rossi, Kimms & McDowell LLP. My primary practice is in intellectual property law. Here is a graduation photo!

**April Mitchell (MS ’02)**
I have recently joined a cloud data security start-up, Dasera, as head of engineering.

---

**Rahul Bhotika (PhD ’03)**
I was promoted in October 2020 to “Director, Computer Vision” at Amazon.

**Myroslava Dzikovska (PhD ’04)**
I am still working for Google Health. My biggest piece of impact is that the app that I worked on, Streams, ended up being used by doctors caring for acutely ill patients in a couple of London hospitals during the pandemic. Now I am working on Care Studio (<https://health.google/for-clinicians/care-studio/>), a new application to bring Google search capabilities to improve health care in the US hospitals. I have recently moved cities, as I really did not enjoy living in London during the pandemic. So, in July 2020, I moved back to Edinburgh, where I had lived for 11 years before joining Google. This made my life much better because I can meet with friends for (socially distanced) walks outside without relying on public transport and have multiple beautiful parks to visit within walking distance. I like the quality of life so much better that now I’m looking for options to make my Edinburgh stay permanent.

**Nate Blaylock (PhD ’05)**
In February, I started a new position as CTO of Canary Speech, a startup that uses speech as a digital biomarker to diagnose a variety of diseases as well as cognitive and mood conditions.

---

**Paul Ardis (PhD ’10)**
I was recently promoted to technology manager–machine learning, so I’m now leading ML research activities for GE.

**Benjamin Van Durme (PhD ’10)**
In the last couple of years, I was granted tenure at Johns Hopkins University (JHU), moved my family immediately before pandemic lockdown, and began a 50/50 hybrid role as a researcher at Microsoft Semantic Machines. My family is well, with two young boys healthy and loving school.
Undergraduate Alumni Notes

Steven Lewis ’00
was ordained a priest of Jesus Christ for the Catholic Diocese of Rochester. He began his priestly ministry in Tioga County, New York (Owego and the surrounding area) at the end of June.

Brendan Heavey ’02
manages the value-based reimbursement team within the actuarial department at Independent Health in Buffalo. Their mission is to identify ways of increasing the value of insurance plans by identifying and reducing variation across different episodes of care. Brendan uses his URCS education on a daily basis.

continues to backpack, rock climb, and mountaineer in his spare time. Last year he summited Mt. Adams, and this year he plans to climb Mt. Olympus and Glacier Peak in Washington State.

Recent PhD Graduates

Tianlang Chen
Joint Visual-Textual Modeling for Multimodal Content Classification, Retrieval and Generation
Amazon, Applied Scientist
Faculty Advisor: Jiebo Luo

Shupeng Gui
Neural Embedding: Compact, Robust, and Non-euclidean Solutions
Facebook, Research Scientist
Faculty Advisor: Ji Liu

Zahra Razavi
Dialogue Management and Turn-Taking Automation in a Speech-Based Conversational Agent
Faculty Advisor: Len Schubert

Parker Riley
Text Rewriting with Missing Supervision
Google, Software Engineer
Faculty Advisor: Dan Gildea

Samih Samrose
Modeling and Mediating Conversational Norm Violations
Read AI, Data Scientist
Faculty Advisor: Ehsan Hoque

Taylan Sen
Interpersonal Communication Analysis with Facial Expression Encoding and Interactional Modeling
Faculty Advisor: Ehsan Hoque

Hanlin Tang
Communication Efficient Machine Learning
Tencent, Research Scientist
Faculty Advisor: Ji Liu

Zhengyuan Yang
Visual Grounding: Building Cross-Modal Visual-Text Alignment
Microsoft, Researcher
Faculty Advisor: Jiebo Luo

Anis Zaman
Combining Traditional and Non-traditional Data Stream for Understanding Mental Health
eBay, Research Scientist
Faculty Advisor: Henry Kautz

Share your thoughts on Multicast.
We’re interested in hearing about who reads it, what content you like and dislike, and any thoughts you have on improving our communications. Scan the QR code to take the anonymous survey, open until the end of 2021.
Women and Minorities in Computing (WIC-MIC)

In Spring 2021, WIC-MIC successfully introduced a new model for general meetings. These virtual, biweekly sessions allowed members to connect and catch up while also providing opportunities for academic and professional development. Some meetings were more relaxed, discussing topics like course planning in a peer-to-peer environment. Others were more focused on professional development; for example, a visiting Postman API representative provided an informative, fun training module for students. WIC-MIC also hosted speed-friending and speed-networking events, which proved especially successful in getting members talking among themselves and with guests. In the coming year, they hope to expand and improve on the program, with a special focus on creating a fun, active, and rewarding space for underrepresented students in computing.

Computer Science Undergraduate Council (CSUG)

CSUG’s executive board has worked hard to bring more programs, events, and resources to undergraduate students. The executive board recently expanded to include two new positions: First Year Representative and RocLabs Chair. The First Year Representative connects incoming first-year students to CSUG activities, academic resources, and other forms of support, while the RocLabs Chair oversees a committee facilitating student collaboration on technical projects.

CSUG introduced exciting new events this past year, including the 2020 Summer Challenge Series. The series included two competitions, one on CSS (cascading style sheets, a web formatting language) development and the other on coding interview questions. The goal of each challenge was to encourage students to learn and develop new skills during the quarantine period. Additionally, CSUG conducted a weekly series of coding workshops; these were student-led sessions focused on solving technical questions typically presented in internship and job interviews. CSUG also started an open-source initiative on its (brand new!) official website, ur-csug.org. Students are encouraged to contribute to CSUG’s open-source projects, to learn new technologies, and to become familiar with GitHub.

Last year, CSUG received two awards for its leadership and community impact. The first award was the University Student Life Award, also known as a Rocky, for Excellence in Programming. CSUG received a Rocky in recognition of its successful organization and expansion of the DandyHacks hackathon on a virtual platform as well as its expansion: participation increased from 173 students in 2019 to 250 students in 2020, with a total of 38 projects submitted.

Secondly, the Alice DeSimone Award was presented to the president of CSUG, Aman Shrestha, as a part of 2020 Student Leadership Appreciation season. Shrestha was recognized for his dedication, enthusiasm, and collaborative skills; he has truly made CSUG an ever-better organization!
Congratulations Class of 2021!

Shreif K.e.h. Abdallah
Abdelrahman Mohamed
Ali Abdelkader
Constanza Aceves
Rodriguez
Abhisesh Acharya
Jeffron Addy
Saad Ahmad
Ziyi Ai
Ehab Ajmal
Mustafa Ali
Victor Nikhil Antony
Marlie Cassidy Augustin
Amit Bhattarai
Daniel Busaba
Emma Campbell
Nicholas Caraballo
Xinyi Chen
Zhengdong Chen
Prinaya Choubey
Joshua A Cohen
Hengguang Cui
Kaile Ding
Sydney J Dhopolsky
Yuqiu Dong
Dominique Cecile Dorvil
Thabani Dube
Alexandra Ferrante
Kenda Flores-Garcia
Bowen Fu
Yicheng Gao
Liam G Geffen
Thomas Winter Geiger
Aaron J Gindi
Kainoa G Giomi
Leah Goodwin
Adam D Green
Duncan Grubbs
Junkang Gu
Dominick Alexander
Harasimiuk
Marcus Anthony Hill
Thu Hoang Phan Ha
Wanyin Hu
Jamie L Huber
Muhammad Usama Ijaz
Anesi David Ikhianosime
Andrew A Jarvis
Bartlomiej Radoslaw
Jezierski
Dane Ryan Johnson
Kevin Kao
Jason Zeldin Katzner
Nikita Kim
Benjamin Kuehnert
Andrew Alexander
Lavrushyn
Dung Tuan Le
Matthew J Lee
Jilin Li
Tianyi Li
Rebecca Liu
Sihao Liu
Tianyi Liu
Ermiyas Liyeh
Jiahao Lu
Qingjie Lu
Yilin Luo
Claire MacCormick
Lamine Male
Kevin Martinez
Scott McKinney
Jayda Medina
Muskaan Mendiratta
Olivia G Morton
Emanuela Natali
Hieu Dang Nguyen
Oliver Orion Otcasek
Hong Jun Park
Michael Pawlicki
Anh Quoc Pham
Patrick Andrew Phillips
Jeffrey Pinsker-Smith
Kevin J Pottackal
Sarmishtha Prathivadhi-Bhayankaram
Liza Miriam Pressman
Alexander Curtis
Rabideau
Joshua Ethan Radin
Nurfaizi Rafiuddin
Nathan H Reed
Emely Rosa-Ortiz
Riordan Helen Ryan
Akira Sah
Nicholas Salem
Avin J Saven
Hzeyye Mehmet Sel
Mingyuan Shan
Aman Shrestha
Joshua Ziffer Sobel
Ashton Sopher
John Sosa
Jiangui Su
Yiyang Su
Mingqin Sun
Matthew W Sundberg
Advaith Suresh
Ariel Tello
Ashely Tenesaca
Brandon J Toops
Sirui Wang
Xiwei Wang
Yuanzhuo Wang
Ziyi Wang
Melissa Welsh
Bowen Wu
Yihang Xu
Zhengyuan Xu
Jaijiang Yang
Qiaoyu Yang
Tongyu Yang
Yanwei Yang
Yifei Yang
Kecheng Ye
Montel Yu
Boyu Zhang
Dan Zhang
Haoqi Zhang
Shuran Zhang
Yipeng Zhang
Yixin Zhang
Grace Zheng
Yuqiao Zhu
Anna E Zimmerman
Canruo Zou

www.cs.rochester.edu
The number of computer science PhD students from underrepresented groups has seen a steady decline in the US, while the number of students from historically privileged groups has remained largely the same (2019 Taulbee Survey).

The gender ratio of assistant professors in computer science is so imbalanced that, with sustained effort, it would take 50 more years to obtain gender equality (S. Way, D. Larremore, and A. Clauset, 2016).

So, what can we do today?

The Department of Computer Science launched an Inclusive Computing Program in the 2020–21 academic year, supported by a Google exploreCSR award that aims to engage a diverse body of University of Rochester undergraduate students in computing research, especially female, LGBTQ+, BIPOC, and first-generation college students, as well as students with accessibility needs.

Led by Professors Ehsan Hoque and Zhen Bai, the program provided rich research experiences in order to help increase students’ competence in computing and collaborative skills to solve real-world problems. It also sought to boost each individual’s sense of belonging in the world of computing and their interest and confidence in pursuing graduate study.

Participation: The program attracted 85 applicants from a diverse range of academic backgrounds, such as computer science, data science, applied mathematics, electrical and computer engineering, biomedical engineering, neuroscience, psychology, economics, and linguistics. Thirty students from diverse backgrounds (55 percent female, 43 percent BIPOC, 40 percent LGBTQ+, 33 percent first-generation college, 7 percent students with accessibility needs) were selected to join the first cohort of the Inclusive Computing Program.

Activities: Students engaged in several research activities throughout the academic year. To start, they participated in a two-hour orientation workshop that showcased various computing research topics and a roundtable discussion with researchers from marginalized communities. Activities also included 40 hours of paid, hands-on research advised by faculty members with joint research interests; a roundtable discussion with six UR alumni from Google on career path, graduate education, and professional development; and other various research and professional development opportunities.

Outcome highlights: Students in the program took part in a variety of research areas spanning AI/ML, human computer interaction, system, and computational cognition.

An analysis of the pre- and post- self-reported survey responses indicated that there was an increase in students’ “self-efficacy,” “research skills,” and “sense of belonging” and a decrease in “imposter syndrome.”

Duong Phan, CS ’23, writes, “[the workshop] gave me more insights into researching and helps me to confirm the future career path I want to follow. I was able to make great progress, thanks to constant feedback and guidance from my supervisor and research partners—I would definitely take the program again if I have a chance.”

Faculty engagement: The workshop was supported by several URCS faculty members who took on the role of mentor, including

AI: Dan Gildea, Jiebo Luo, Lenhart Schubert, and Robert Jacobs
HCI: Zhen Bai and Ehsan Hoque

Professor Len Schubert, who supervised three students, writes, “The students learned about symbolic processing, representing the meaning of language, and using these representations in story processing, inference, and learning; and they were able to make significant contributions to our research projects in these areas during the Spring semester.”

A snapshot of the kickoff event with some of the participants and faculty mentors
Alumni engagement: We were fortunate to engage with some of our distinguished alumni who participated in a roundtable discussion with the workshop participants. The panelists included Iftekhar Naim, PhD ’16, software engineer (advised by Daniel Gildea), Melissa Dominguez, PhD ’03, engineering manager (advised by Robbie Jacobs), Chetan Bhole, PhD ’14, software engineer (advised by Henry Kautz), Bo Hu, PhD ’05, software engineer (advised by Chris Brown).

Peter Battaglia, BS ’02, research scientist at DeepMind (advised by Robbie Jacobs), BiJun He, MS ’04, product manager (advised by Michael Scott).

Acknowledgments: We also appreciate the generous support from the David T. Kearns Center for Leadership and Diversity in Arts, Sciences & Engineering, the Gwen M. Greene Center for Career Education and Connections, and the Office of Minority Student Affairs, as well as the various UR communities, such as the Women and Minorities in Computing (WIC-MIC), the Society of Hispanic Professional Engineers (SHPE), the Society of Women Engineers (SWE), the National Society of Black Engineers, Pride Network, and the Womanist Club.


Let’s Welcome:

We Welcome Our New Postdoctoral Member

URCS is delighted to welcome Dr. David E. Narváez to the department; he joined us in January 2021 for a two-year postdoctoral appointment. Narváez has been working with Professor Lane A. Hemaspaandra on the connections that structural complexity theory has to SAT solvers and computational social choice, especially regarding issues of search versus decision. Hemaspaandra notes that “David is an outstanding, versatile, creative researcher. It is a real treat having him here, and he is already collaborating with us on multiple projects.” Narváez’s stay at URCS is supported by a prestigious award from the highly competitive CRA/NSF CIFellows 2020 program.

Narváez’s interests are broad, encompassing complexity, computational social choice, constraint satisfaction, CS education, and extremal combinatorics. He has published on all these topics, and his more recent paper with Brakensiek, Heule, and Mackey, which shows that a tiling claim (Keller’s Conjecture) holds in seven-dimensional space, won the Best Paper Award at the 2020 International Joint Conference on Automated Reasoning.

Narváez’s thesis for his PhD in computer science from Rochester Institute of Technology, defended in December 2020, was titled “Constraint Satisfaction Techniques for Combinatorial Problems” and was advised by Professor Edith Hemaspaandra and Professor Stanisław Radziszowski. Narváez’s CS MS degree is also from RIT and his BS in Systems Engineering and Computing is from Universidad Tecnológica de Panamá. His career goal is to become a professor of computer science.

We Welcome Our New Babies

The department is delighted to welcome so many new additions this year, including three faculty babies!

Keith, Professor Zhen Bai’s son, born March 2021

Amella, Dr. Eustrat Zhupa’s daughter, born May 2020

Andrew, Professor Chenliang Xu’s son, born November 2020

www.cs.rochester.edu
Multicast Team
Editors: Elaina McKie and Emily Tevens
Faculty advisors: Lane A. Hemaspaandra and Ehsan Hoque
Contributors: James Allen, Zhen Bai, Piotr Faliszewski, Lane A. Hemaspaandra, Ehsan Hoque, Kaave Hosseini, Johanna Lester, David E. Narváez, Jim Roche, Michael Scott, Yuhao Zhu
Design and copyediting: Creative Services, University Communications

We want to hear from you!
Please help us keep our alumni records updated by emailing us your current email, place of employment, and mailing address.
Graduate alumni: gradalumni@cs.rochester.edu
Undergraduate alumni: ugalumni@cs.rochester.edu

Stay Connected by Joining "URCSD Alumni" on Facebook