FAR-SIGHTED: BLIND STUDENT NOAH AL HADIDI EARNS SECOND CSU DEGREE

Jeff Dodge

It’s difficult enough for students to come to CSU from an Arabic-speaking country, having to get used to a new language and culture. Let alone if they’re blind – and they choose a highly visual subject like computer programming.

Noah Al Hadidi did just that, earning his undergraduate degree in computer science from CSU in 2015. But that wasn’t enough: Last year, he also collected a master’s degree in computer information systems.

Al Hadidi, who is from Oman, has been blind since he was seven months old. After being educated in Bahrain, he attended high school in Saudi Arabia and worked for a company that distributed assistive technology tools. His manager, who had gone to school in Colorado, encouraged Al Hadidi to pursue a U.S. college education in computer science.

“So I said, ‘OK, I’ll do it,’” he recalls.

Choosing CSU

Al Hadidi was lucky enough to gain a scholarship for tuition and fees from the Ministry of Higher Education in Oman, and an anonymous donor agreed to pay for his housing and living expenses. He chose to attend CSU on his student visa because of its many resources for students with disabilities. And he’s glad he did: His computer science instructors used objects to demonstrate physically, through touch, concepts like the “tree” data structure.

“We got creative with things, using pipe cleaners, clay and magnets,” Al Hadidi says. “In my undergraduate education, they did the impossible. It’s remarkably amazing that I was able to graduate with a degree in computer science.”

He credits faculty who were willing to take the time to learn how to help him, as well as two CSU offices: Resources for Disabled Students and the Assistive Technology Resource Center.

Al Hadidi has several tools to aid him, including a screen reader (although he prefers using Braille in math classes because it lets him more easily move between lines and sections on a page, rather than listening to one line at a time). On the internet, in addition to the text on a web page, he relies on the “alternative text” that webmasters are supposed to enter with the images they post, to describe what is pictured.

“That’s what I’m depending on to get information,” Al Hadidi says. “If it’s not accurate, I’m losing a lot. Your description is my only way to see your website.”
MESSAGE FROM THE CHAIR

Welcome to the spring newsletter from the Department of Computer Science. As most of you probably know, there is unprecedented growth in the number of computer science majors around the U.S., and our department is no exception. We now have over 800 majors. The interest in CS is also reflected in the large number of students from other disciplines who want to take a class in computer science before they graduate from CSU. Interest outside the classroom is surging as well. Our Tech Networking Dinner was again well attended this year, drawing a large number of students and companies.

We are very happy to welcome Vinayak Prabhu as a new assistant professor this winter. His work deals with cyber-physical systems, which allows him to connect with other faculty in the department who have related interests.

It has been my privilege to serve the Department of Computer Science as chair for the past 15 years. I will be stepping down this summer on June 30th but expect to remain at CSU and continue working in the department. I have had the pleasure of interacting with many talented, interesting people over the years in my role as chair. And, as always, thank you for your support of the Department of Computer Science at CSU.

Enjoy this newsletter, read more news on our website, and feel free to contact us or stop by – you are always welcome!

Darrell Whitley, Ph.D.
Professor and Chair

DEPARTMENT HIGHLIGHTS

CREATING SMART, RESILIENT, SECURE SYSTEMS IS GOAL OF NEW CSU CENTER

Colorado State University is home to a new National Science Foundation research center focused on innovative ways to protect large, networked systems from cyberattacks. CSU’s Center for Configuration Analytics and Automation was recently established through a two-year NSF startup grant of about $300,000. The new center, a partnership among CSU researchers in the Department of Computer Science and Department of Electrical and Computer Engineering, will join existing research programs at the University of North Carolina Charlotte and George Mason University that were established through the NSF’s Industry-University Cooperative Research Centers Program.

SHRIDEEP PALLICKARA HONORED WITH BOARD OF GOVERNORS’ EXCELLENCE IN UNDERGRADUATE TEACHING AWARD

Congratulations to Associate Professor Shrideep Pallickara, who has received the 2017 Board of Governors’ Excellence in Undergraduate Teaching Award. This prestigious award is sponsored by the Board of Governors of the Colorado State University System and presented to a faculty member who stimulates the curiosity of students by motivating and challenging them. One award is presented annually to a faculty member from CSU, CSU Pueblo, and CSU Global Campus, the three institutions governed by the Board. In 2016, Pallickara was named a CSU Monfort Professor in recognition of his research work. He is the only faculty member in CSU’s history to receive both awards.

LOUIS-NOËL POUCHET RECEIVES NATIONAL SCIENCE FOUNDATION CAREER AWARD

Congratulations to Assistant Professor Louis-Noël Pouchet who has received a five-year NSF CAREER award for the project: “Staging Compilers for Heterogeneous Platforms.” Pouchet’s project aims to deliver a complete system to efficiently compile key computation patterns from image processing and deep learning algorithms on heterogeneous multiprocessor systems-on-chips. He proposes to develop performance contracts for various compilation stages: a notion of guarantee that if the compiler receives a source program fitting specific semantics and syntactic restrictions, then a high-performance implementation will be produced as an output. The project combines automatic program generation and deep learning techniques to automatically deduce these performance contracts, along with new polyhedral compilation techniques to further improve the program performance and energy consumption. The goal of this research is to increase developers' productivity by reducing the need for manual code optimization.
AT CYBERTRUCK CHALLENGE, STUDENTS HACK A TRUCK, STEAL THE SHOW

Colorado State University computer science students stole the show at a new national event aimed at increasing cybersecurity in transportation industries.

The CSU team participated in the first-ever CyberTruck Challenge, held last June and sponsored by the U.S. Army Tank Automotive Research Development and Engineering Center and the Michigan Defense Center. The intensive, weekend event hosted several university teams, providing engineering tutorials and practical training in cybersecurity for heavy vehicles. The CyberTruck Challenge is modeled after the Society of Automotive Engineering/Battelle CyberAuto Challenge, which focused on security for passenger cars.

Hacking a truck's controls

Ph.D. student Subhojeet Mukherjee and sophomore Jake Walker, both mentored by Professor of Computer Science Indrakshi Ray, successfully performed key assigned tasks during the challenge. They turned off a running truck using only computers connected to a Controller Area Network – away from the driver’s seat. They also kept the engine running when the key was out. Finally, they demonstrated the ability to spoof random values on the dashboard, and cause other aberrant behaviors in the vehicle.

Event organizers described its purpose as enhancing “ubiquitous, reliable, safe and cost-effective transportation.” That means training the brightest minds in engineering and cybersecurity to understand how a hacker might attack a transportation system, and how to stop it.

“The Challenge actually allowed us to interact with people from different domains, test our hypotheses on real trucks, and get feedback from engineers and security professionals,” said Mukherjee, who is investigating computer and vehicular security for his thesis. “We were really excited to see that our hypotheses were true in many circumstances.”

Walker enjoyed the chance to apply his knowledge and learn new skills. “This challenge provided me with a unique opportunity to learn about this field I am interested in,” he said. “It proved to me the importance and necessity of heavy vehicle security.”

Further research

Under Ray’s guidance, Mukherjee and Walker are conducting research on heavy vehicle cybersecurity, funded by the National Science Foundation. They collaborate with a team from University of Tulsa led by Rose Gamble and Jeremy Daily. The CyberTruck Challenge was a chance to enhance the existing collaboration, Ray said.

“I am very proud of what my students are achieving,” Ray said. In their continued work with University of Tulsa, their goal is to have their research validated by the National Motor Freight Traffic Association, she added.

Subhojeet Mukherjee was awarded first place for this research, called In-Com Vec Sec, in the CSU Ventures Drivers of Innovation category at the CSU Graduate Student Showcase.

HOW DO YOU SUMMIT DEVIL'S TOWER AT AGE 87? ASK COMPUTER SCIENCE CHAIR EMERITUS ROB KELMAN

Computer science is just a passing fad. That’s what people thought in the early 1980s. Yes, scientists had large data processing machines, but home computing was in its infancy, and few grasped how ubiquitous computers would eventually become.

The math department spun off computer science in 1974, and by 1980 it was bursting with 600 majors – similar to today’s enrollment – but only 11 faculty. There was no academic advisor, and resources were slow coming to the fledgling department in an unproven, emerging discipline.

How do you grow a computer science department in the face of steep challenges with no roadmap?

Rob Kelman unpacked his problem solving skills. Kelman, now a professor emeritus, took the helm as chair in 1981 armed with a background in numerical analysis and a “figure it out” attitude. Known for his careful analysis and methodical approach, he hired faculty, created the key advisor position, and built a summer program to generate income, laying foundational bricks of the department you see today. Current department chair Darrell Whitley came on board in the mid-80s and remembers, “Rob was a fabulous chair. He was wise, thoughtful, and made good decisions.”

But work isn't the only place Rob Kelman applies these skills. For over 40 years he has been an avid climber. This past summer, he completed the technical route to the summit of the 867-foot Devil’s Tower in Wyoming. And he did it at the age of 87, making him the oldest person to do so. His tenacity and longevity in the sport are rooted in the same “figure it out” spirit he brought to the new Department of Computer Science decades ago. His climbing philosophy and adventures were recently highlighted in the Coloradoan.

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COLLEGE OF NATURAL SCIENCES – COMPUTER SCIENCE
COMPUTER SCIENCE INCLUSION AND EXCELLENCE INITIATIVES ENDOWMENT ESTABLISHED

We are proud to announce the creation of the Computer Science Inclusion and Excellence Initiatives Endowment to support the participation and retention of underrepresented students pursuing computer science careers. Initiatives include ongoing scholarship assistance, educational environments that support a diverse student community, and expenses associated with participation in professional societies/conferences. An anonymous donor has agreed to match any gift, dollar for dollar, up to $25,000, to support these initiatives. With your help, we have the incredible opportunity to raise $50,000 to endow the fund. We hope that you will join us in this effort and make a gift. Thank you for your consideration!

DEPARTMENT AWARDED VITAL FACILITIES IMPROVEMENT GRANT

Computing does not just facilitate our discipline, it is our discipline. State-of-the-art facilities and equipment are vital to our research and teaching missions, and to help us along, the department has been awarded a $200,000 Institutional Research Facilities Improvement grant from the University. We are at capacity for the number of machines we can support. So, we will use the funding for power and cooling upgrades to the department machine room. We will also expand the networks and security machine room and install a new advanced cooling system. Thank you to the Office of the Vice President for Research and the Office of the Vice President for University Operations for offering this grant opportunity.

WE KNOW A THING OR TWO ABOUT DISTANCE LEARNING — WE’VE BEEN DOING IT FOR OVER 35 YEARS

Have you taken CSU computer science distance courses? Thousands of students have. Established over 35 years ago, the Computer Science Department online program is consistently ranked one of the best in the nation, offering 25 courses and a popular Master of Computer Science degree. Our distance program provides a well-rounded education coupled with practical experience. It conveniently fits into non-traditional students' schedules, the classroom interaction and technologies offer a real-time experience, and courses are equivalent to the on-campus courses – taught by the same CSU faculty and carrying the same academic credit. The demand for computer science education is exploding, and our program continues to meet the needs of our ever-evolving profession.

NEW FACULTY AND STAFF

VINAYAK PRABHU

Vinayak Prabhu is an assistant professor with research interests in cyber-physical systems, formal methods, hybrid systems, verification and control. Prior to joining CSU, Prabhu completed postdoctoral research at the Max Planck Institute for Software Systems. He received his Ph.D. from the University of California at Berkeley.

BENJAMIN SAY

Ben Say is a new department instructor and comes to us from Kaufman Hall Peak Software where he was a software engineer working on software for healthcare data analytics. He has an M.S. in Human-Computer Interaction from the University of South Dakota and enjoys the human side of computing, including exploring how people interact with computers and how people learn to use computers.

WENDY STEVENSON

Wendy Stevenson joins the department as our new administrative assistant in the front office. She has 20 years of experience as a project coordinator and program manager in industry.

MORGAN WUNDER

Morgan Wunder, a new department instructor and recent CSU College of Business graduate, has been involved with our personal computing class since her days as a student here at CSU. Morgan’s role as the personal computing instructor is to help her students learn the importance of Microsoft Office (Word, PowerPoint, and Excel) and how to use it effectively in both their career tasks and day-to-day life.

SUPPORT THE DEPARTMENT

Your support of the department is incredibly valuable. Please consider making a difference to today's students, faculty, facilities, and programs — at whatever level is right for you. Thank you!

For more information on giving, contact
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