

Department News

The big news is that **Doug Dunham**, the last original faculty member from when the Computer Science department was created in 1985, is retiring after 40 years at UMD (see article). With Gary Shute's retirement last year, we were approved this year to fill two new, full-time, tenure-track positions. The faculty search committee, headed by **Pete Willemssen**, identified a strong group of candidates, and we are pleased to announce the hiring of **Eleazar Leal** and **Andrew Sutton**, beginning in fall 2017.

Eleazar, a native of Venezuela, is finishing his Ph.D. at University of Oklahoma, focusing on algorithms for trajectory processing and spatial data mining. Andrew, an American with a Ph.D. from Colorado State University,

has been a post-doc researcher for the last six years, most recently in Germany. Andrew's research area is AI, particularly theoretical foundations of search and optimization. Check next year's issue of *Bulldog Bytes* for more about these exciting new hires.

Rich Maclin is back full-time after serving as associate dean of the college. **Hudson Turner** has been elected for another term as department head.

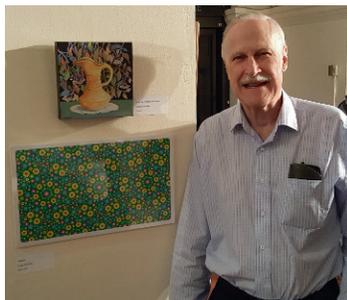
CS enrollment at UMD continues to rise, with new freshman majors up 60% in 2016 over the year before, and it looks like similar numbers are likely in 2017. At the beginning of last year we had 321 declared majors, and anecdotally, it seems like we are meeting with

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Faculty Spotlight

Doug Dunham

From physics major to internationally known computer art researcher, **Doug Dunham's** career has been as colorful and varied as the print of flowers he recently displayed at the Duluth Art Institute.



Doug's retirement marks the end of an era, a time remembered by the nostalgic among us for its seat-of-the-pants approach to computer science and the merging of characters from diverse scholarly backgrounds into a lively mix that would evolve into the CS department today. Doug was the social center of that time, for his indefatigable humor and smile, his sustained commitment to students, and his regular Scotch and salsa tastings.

For many of us who grew up in the middle of the last

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Alumni Spotlight

Jenna Pederson

Jenna Pederson (BS '01) is leading a generation of tech entrepreneurs. She is not only building a community for women in tech in Minnesota, but she's helping to educate the tech community and advocate for them. An early leader of the Twin Cities Geekettes, Jenna saw "a huge demand for a space where women could not only network, but actually *do* tech," she remembers. She and a partner then created Hack the Gap, a space for weekend-long hackathons of women-only teams.



Collaborative coding to close the gender gap is not her only motivation. According to Hack the Gap's mission, "We see a lot of gaps where privilege exists. We focus on breaking down barriers to amplify the voices and talents of people in underserved minority communities."

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century, CS was not a standalone career option, and we got into the field through the back door of a related discipline. In Doug's case, his path went from physics, to math, to CS, and, eventually, to art.

A native Californian, Doug grew up near Pasadena, spent a year of high school in India when his father got a job as a foreign aide, then returned and graduated in 1956 from the same high school Jackie Robinson attended 10 years earlier. He then attended Caltech, graduating with a degree in physics in 1960. He got a job testing rocket engines in Sacramento, spent some time in graduate school in Maryland, then returned to California to work on a lunar lander project.

Dissatisfied with job prospects in physics, Doug returned to school, obtaining a master's in math from California State, Long Beach, in 1966. He was two years into a Ph.D. program at U. of California, Irvine, and teaching part-time at Long Beach, when his thesis advisor was denied tenure, causing him to reboot and enroll at U. of California, Berkeley. That was where he met **Mark Luker**.

"There were eight of us grad students in one room in an old building," Doug recalls. "When the new math building was finished, Mark stood in line overnight to make sure the eight of us got the four best TA offices. One of the offices got an outside commercial phone line, for which we had to come up with a listing for the Oakland yellow pages, and so the *Turing Machine Repair Service* was born." And so was Doug's fabled sense of humor.

While working on his Ph.D. in geometry at Berkeley, Doug discovered that his thesis had been "scooped": someone had independently published the results first. Despite this second thesis mishap, Doug persevered, wrote another thesis, and received his doctorate in 1975, only to find a one-year temp job teaching at Stanford. "Those were hard times for getting jobs," Doug remembers. "There were 1200 math PhDs for only 200 jobs. It was clear that the road to a tenured job was through CS."

While Doug was finishing his thesis at Berkeley, Luker got a position teaching CS for the UMD math department and urged Doug to follow. So in 1977 Doug landed a temporary UMD math job and began to teach himself CS. "I would sit in on Mark's class and teach it myself later — sometimes without sitting in, just reading the text the night

ALUMNI SPOTLIGHT CONT'D FROM P. 1

Jenna's road to Twin Cities tech leadership led in 2011 to her founding of 612 Software Foundry, providing software engineering services to startups and established companies alike.

Growing up in Excelsior, MN, Jenna was into Cabbage Patch dolls, LEGOS and multiple business ventures, including lemonade stands, a baby sitting business, and a failed lawn mowing service. Her computer exposure was limited to an old MS-DOS desktop. "I can still hear the dial up modem sound as I connected to AOL with my screen name 'loislaane'," she recalls. Her eventual choice of UMD for college reveals the virtues of both efficiency and honesty. "I was looking for something away from home but not so far where I couldn't easily get home on weekends to do laundry."

Majoring in CS was not Jenna's first choice. "I wanted to be a doctor — ER was a hit TV show at the time — but I was struggling with biology and loving calculus. I learned I'm more logical and need formulas, algorithms, and processes to learn and remember." While home for the summer she took intro to CS at UMTC, then returned to UMD to finish her degree. Along the way she did an internship with ITSS and learned website scripting. "The biggest struggle in those days was making the code compile," Jenna says. "Now it's the people. There are so many highs and lows with both!"

Following college, Jenna had jobs that prepared her to eventually start her own company. "I learned that writing code is not about the computer and technology but more about the people who will use it." She also got hands-on experience with the latest tech. "We were doing the cloud before the cloud was a thing," she asserts. "I learned what data centers, data replication, availability, and scaling meant in the real world, in the context of people and dollars."

Now, as if running her own company and inspiring legions of tech aspirants were not enough, in 2016 Jenna joined the board of MinneStar, a more traditional tech community that promotes networking



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significantly more prospective students and their parents each year. Additionally, the number of students choosing the CS bachelor of arts (BA) degree has gone from 2 to 40 in three years.

Increased enrollment demand is one reason we are phasing out the CIS (computer information systems) major, which began as the IST (information systems and technology) major in 1999. With the business school recently opening up the business administration minor to students from other colleges, and with the CS BA major giving students more flexibility in choosing a minor, we decided that the CIS major was no longer needed, and without it we will be able to focus our teaching resources better on CS as our enrollment continues to grow.

A few more program notes: We have removed the "second lab science" requirement from the CS bachelor of science (BS) major, making it more compatible with the UMD Liberal Education science requirements. We are also replacing the computer science theory course with a more standard discrete structures course plus an automata theory course. Finally we are dropping the calculus II requirement from the CS BS major.

In 2016-17 Swenson College began a series of community outreach events organized by outreach coordinator **Charity Rupp**. We participated in several of these events, including the Iron Range STEM Showcase, Science and Engineering Day, and Swenson College STEM Tours. Just after last year's *Bulldog Bytes* went to press in spring 2016, **Peter Peterson** organized the first UMD Cybergames Youth League Invitational, in which 30 students from 5 area high schools came to UMD and pitted simple programs against one another in a simulated tank battle. Here are some of the participants sporting their



UMDCYL T-shirts.

* * * * *

Shortly after joining our department in 2014, **Arshia Khan** started a local Women in Computing (WIC) group. Last February, eight women UMD CS undergraduate and graduate students attended MinneWIC, the ACM-W Celebration of Women in Computing for the Upper MidWest, in Minneapolis.



Front row: **Xinru Yan, Kun Li**. Back row: **Rushmeet Bahra, Xue Gao, Swathi Vallabhajosyula, Arshia Hassan, Janna Madden, Yichen Wei**.

The trip was a great success, with posters presented by three undergraduates (Kun, Janna, and Yichen) and three graduates (Rushmeet, Xue, and Xinru). Janna won Best Undergraduate Poster Prize for her work on telemedicine in rural health care, while Kun received honorable mention for her mobile autism application. Xue took home graduate honorable mention for her user interface for group decision making.

It was also announced that the UMD CS department will be hosting MinneWIC 2019! Thanks to Arshia for making this happen.

* * * * *

Finally, last year the CS department began organizing "TechTeas," social events combined with topical technical content. If you would like to find out how to connect with our students by giving a presentation describing cool technology that your company is involved in, feel free to contact us. ■

FACULTY SPOTLIGHT CONT'D FROM P. 2

before. After two years as a temp, they made a tenure track position for me." The rest, as they say, is history.

Doug's 40 years at UMD reflects the history of CS both locally and in the large, from its inception as a branch of the math department, to its disruptive split into its own, to the addition of a graduate program, and through the many changing programming paradigms that make up the discipline. Doug has taught large lecture intro courses, architecture, data structures and algorithms, graphics, theory, and automata. He has supervised dozens of master's students and taken his turn as department head.

Doug's passion for geometry, particularly hyperbolic patterns and fractals, found a natural expression in computer art. He regularly presents at the Joint Math Meetings, the European Society for Mathematics and the Arts, and the Bridges Conference, culminating in his award at the 2017 Mathematical Art Exhibition for best print, "Fractal Monarchs."

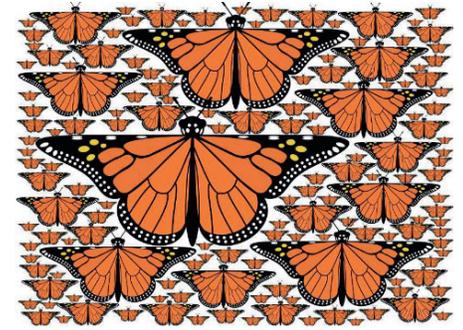
The writer of this article remembers joining the department nearly 30 years ago when Doug sported a beard and cut a rather jovial figure. Even then, Doug's obsession with fitness was apparent, with marathons and more dominating his schedule. The writer recalls regularly taking several hours off at noon to run with Doug along Skyline Parkway in preparation for Grandma's Half Marathon, for which Doug had a lifetime registration. As if that were not enough, Doug, an experienced swimmer, began entering local triathlons, employing personal trainers to whip himself into shape.

Doug's penchant for humorous stories and anecdotes found expression at department gatherings of all kinds, from faculty meetings to Doug's Friday afternoon "effervescent fluid seminars" at local pubs. The growth of email and the Internet provided the perfect medium for spreading Doug's humor, and some of us have vast folders of jokes and gems courtesy of him.

Now, after a 42-year academic career, Doug is retiring so that he can relax and reflect on a life well lived, right? Actually, we suspect that Doug needs more time, at 78, for his legendary "blubber burn" exercise workouts, to continue to create exquisite images, and to accommodate his wife Helena's demand for international travel.

Like the Monarch butterflies meticulously rendered by his

algorithms, Doug is among the last of an endangered species of computer science academic — multifaceted, noble, and elegant to behold. ■



ALUMNI REFLECTIONS

Doug was devoted to teaching and research, leaving a legacy noted by decades of alumni, many of whom remember his character. **Doug and Don McGregor** (BA '81): "Doug was always patient and kind and helped us through a difficult degree." **Dheeraj Reddy** (MS '99): "Prof. Dunham was one of the nicest people in the department with possibly the warmest smile." **Kedar Bhumkar** (MS '06): "Doug's high level of work ethics stood out for me." **Amit Lath** (MS '02): "Doug left a lasting impression on me that shaped the man I've become."

Many alumni highlight Doug's teaching, particularly graphics. **Rahul Bora** (MS '96): "Doug was a very special teacher. His Computer Graphics classes were the best CS classes I took in grad school." **Kristy Vanhornweder** (BS '96, MS '02): "I had a great time taking Doug's User Interfaces and Computer Graphics courses." **Steven Miller** (BS '87): "Legions of students have been influenced by his passion for graphics."

Doug's humor and tastes were not lost on his students. **Joe Walker** (BS '03): "Professor Dunham always had his running shoes on just in case a marathon broke out." **Bora**: "I remember the annual party he hosted featuring salsas from around the world. With names like *Inferno*, it took courage and big helpings of yogurt to try them." ■

ALUMNI SPOTLIGHT CONT'D FROM P. 2

for the support of new entrepreneurial ventures. Ever inclusive, Jenna hopes her presence "will continue making MinneStar a place for everyone because it helped give me a place in tech."

Jenna is not particular when reflecting on her life in 10 years. "Working from Mars. Retired. On a sailboat. Being a ski bum. Visiting all the Major League ball parks and National Parks." From what we've seen, any of these is possible. "But seriously, I'm always on the hunt for the next best thing. I love that tech is constantly changing." ■

Alumni Spotlight

Andrew Timm

For **Andy Timm** (BS '98), the third time's the charm. That's how many times he has joined PTC, a global provider of technology platforms and services specializing in the Internet of Things (IoT). Last summer he was promoted to Chief Technology Officer, a role he relishes for the fast-paced change imposed by the emerging IoT ecosystem. "We need a highly agile process that allows a prototype to be developed in days," Andy says. "It then evolves as we learn more about what works and what doesn't."



Andy grew up in Anoka, MN, and although he remembers buying an Apple IIc in grade school and teaching himself BASIC, he started at UMD as a chemical engineering major because it was the highest paying degree. But he soon switched to CS. "I loved how code allowed you to build things. Any application you can dream up, you can build – and there are an infinite number of ways to make happen what you want to have happen."

As Andy looks back on his UMD experience, his technical writing class stands out as formative. "Learning how to convey facts in a concise manner has been critical to my success. I was good at writing code, but I was better at extracting requirements from non-technical people and documenting them."

Over his career, Andy has learned that in software development technology is the easy part. "There are any number of reasons projects can fail," he says. "Company politics, competing priorities, poor planning, overly optimistic estimations, unforeseen world events, etc. Mapping business challenges and opportunities to technical capability became one of the most useful skills in my toolbox."

Andy loves his job because there is no typical work day. "IoT moves at a pace never before seen. I read about new tech and how others have applied it. I cultivate an extensive network of people with similar interests. We're all just learning. I hope to play a role in redefining the IoT and Augmented Reality landscape. Big things are coming, and it's an exciting time to be in this field! ■

Undergraduate News

After two years of domination at the DigiKey Collegiate Computing Competition, the UMD computer programming juggernaut was finally stopped in 2016. Two teams, composed of **Cody Seavey, Christopher Dressen, Joe Kachelmeier, Jake Pulkkinen, Mazin Jindeel, Ruta Wheelock,** and **Jacob Onsgard,** coded valiantly but failed to bring home the trophy.

In early 2017, UMD CS students participated for the first time in another programming contest, hosted by Northern Michigan University. Organized by our Women in Computing group and accompanied by **Arshia Khan** and **Jim Allert,** UMD fielded the only two all-female teams among the 34 teams participating from 6 schools. The teams, composed of **Megan Effinger, Abigail Pederson, Ruta Wheelock, Sydney Matthys,** and **Elise Honerman,** performed

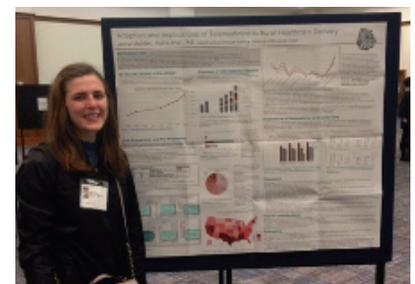
admirably in their inaugural competition, finishing 13th and 16th out of the 34 teams. Wait till next year!

Front row:
Megan, Abigail.
Back row: **Ruta,**
Sydney, Elise, Prof. Khan, Prof. Allert.



In April, the department was represented by two students at the conference of the National Council on Undergraduate Research (NCUR) at the University of Memphis. **Janna Madden**

presented her work on telemedicine in rural health care, and **Yichen Wei** gave a poster on applying musicology to help Alzheimer's patients. Both students are supervised by **Arshia Khan.** Arshia and



Yichen were also featured on UMD's news website spotlighting research and academics.

Our annual academic awards and scholarships were announced in May. The award for Outstanding Academic Achievement went to **Laura Krebs**, while **Janna Madden** was honored for Outstanding Senior. Here are Laura and Janna with department head **Hudson Turner**.



This year we were able to offer five scholarships which were awarded to **Ryan Gebhart, Abigail Pederson, Jenny Smith, Yichen Wei, and Ruta Wheelock**. Here are Ryan, Abigail, Yichen, and Ruta at the awards party.



2016-17 Graduating Seniors

**Elliot Anderson
Samuel Anderson
Ryan Bakken
Stephen Bernard
Evan Carufel
Raymond Cerney
Bingxuan Chen
Michael Coughlin
Dylan Cox
Adam Deeg
Bob Effinger
Michael Ellison
Zach Foede
Thomas Geesman
Jesse Goebel
Austin Gordon
Kade Helseth
Adam Hoefs
Phil Javinsky
Mazin Jindel
Jessica Joyal
Ryan Klaassen
Laura Krebs**

**Kun Li
Janna Madden
Gary McKeever
Mohamed Mobarek
Keith Nickell
Isaiah Nolan
William Olding
Grant Page
Ryne Prochaska
Matthew Raymer
Kris Samuelson
Michael Schlosser
Ben Schoenfeld
Dustin Scholz
David Stenzel
John Sudduth
Anthony Thielen
Jazmyn Turner
Eric Wellman
Bo Wen
Dana Williams
Jimmy Yu
Gaoming Yuan**

Graduate Program News

Last winter, **Xinru Yan** (BS '16), a first year MS student working with professor **Ted Pedersen**, participated in a Workshop on Semantic Evaluation "shared task" on computational humor. Shared tasks are friendly and open competitions, and in this task participants attempted to model humorous text, in particular, to decide if a tweet is funny or not. Xinru built a statistical language model from text known or believed to be "funny," and in two related competitive subtasks her approach placed 1st and 4th in this international event.

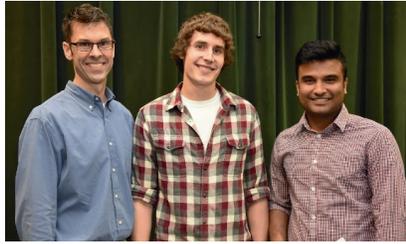
Each year, UMD students present selected graduate students with the Bulldog Award, which honors students for outstanding service that has positively affected the University community during the calendar year. In 2017, three such awards were given and two of them went to our own **Jonathan Beaulieu** and **Manoj Prakash**.



Nine second-year CS master's students participated in commencement ceremonies on May 6 at the Duluth Entertainment and Convention Center. Shown below are **Brandon Paulsen, Penghuan Ni, Manoj Naik Prakash, Jonathan Russert, Ankit Gupta, Sai Kowshik Vattipally, Sandeep Vuppula, Xue Gao, Rushmeet Bahra**.



The Graduate Teaching Assistant awards went to **Jon Russert** and **Manoj Prakash**, shown here with Prof. **Pete Willemssen**.



The annual graduate student picnic this year featured a slack line:



Front row: **William Jaros, Xue Gao, Arshia Hassan, Madiha Mirza, Swathi Vallabhajosyula, Sandeep Vuppula, Sai Vattipally, Kushagra Kumar, Zhiyuan Peng, Dennis Owusu.** Back row: **Noah Miller, Ankit Gupta, Rushmeet Bahra, Jonathan Russert, Jonathan Beaulieu, Xinru Yan, Manoj Prakash, Sai Cheedella, Vaclav Hasenohrl.** ■

In Memoriam

In the summer of 2016 we received sad news of the passing of **Murthy Ganapathibhotla** (MS '06) due to a tragic accident. Murthy had long standing interests in machine learning, information retrieval, and natural language processing, and was working on his Ph.D. at the University of Texas, Dallas.

Carolyn Crouch (retired) served as Murthy's thesis advisor at UMD and offered this remembrance: "Murthy was brilliant, dependable, and solved difficult problems for our INEX research group. He was mature, honest, kind, had a great sense of humor, deep concern for others, and was completely selfless."



Carolyn points out that Murthy had the foresight, at a

young age, to become an organ donor, and his family is proud that all of his organs were used for transplant. "How like Murthy!" Carolyn observes. "He would have appreciated it if he knew that his difficult experience resulted in others deciding to be donors as well. To know Murthy was to love him. He was one of the finest young men I have ever known." ■

A Night in the Wilderness

By **Steve Holtz's** reckoning, over the years he, his wife Ann, and their various dogs have spent more than 700 days paddling and camping in the Boundary Waters Canoe Area Wilderness. Steve, who earned a CS bachelor's degree from UMD in 1999 and a master's degree in 2001, even lived with Ann on a lake on the edge of the BWCAW before joining the CS department as an instructor in 2001.



Steve and Ann are known for spending weeks at a time in the wilderness each summer for the solace and rejuvenation it provides. In Ann's words, "We go to sleep to owls, loons, and trumpeter swans." But on Father's Day in June 2016, just after *Bulldog Bytes* went to press, they had a night-time wilderness experience of a far different sort.

Camped on Duncan Lake, Steve and Ann weathered a storm in which the wind was so intense, "It blocked out the sound of the falling trees," recalled Ann. When it subsided briefly they heard a distressed young voice from the other side of the lake. It was 14 year-old Jake Walz, who had been struck by an enormous falling white pine. The windfall killed his father and left Jake with two broken femurs, a crushed pelvis, and broken back, ankle, wrist, and neck.

To facilitate Jake's rescue, Steve and Ann had to paddle the width of Duncan Lake twice and make a 77-rod portage into Bearskin Lake where their car was parked — at night, surrounded by lightning. Then they had to enlist the help of an emergency medical team that completed the rescue. Those involved credit Steve and Ann with reducing the rescue time by 40 minutes, critical and perhaps life-saving for Jake. (cont'd next page)

Steve's role in the rescue is more impressive considering that, although an accomplished wilderness trekker, due to an old injury he does his paddling with essentially one hand.



Those of us who teach know the satisfaction that comes from helping young people, but Steve and Ann's rescue experience was far more

profound. As Steve observed, "Jake is a part of our life now even though we don't know him." ■

Alumni News

Christopher Becker (MS '12) is a PhD student at University of Utah and has completed internships at Idaho National lab the past two summers. He is currently working on a project related to real-time wireless spectrum monitoring.

Preethi Chimerla (CS MS '16) is a full stack mobile developer at Inspyrus Inc in the San Francisco Bay Area and says, "Dr. Pete Willemssen motivated me and helped me to reach the level in life where I am right now."

Peter Euphosin (BS '06) is currently the Manager of Server and Application Operations at Datlink, an Insight Company.

Scot Halverson (MS '12) left Los Alamos National Laboratory in 2016 to join Descartes Labs, a start up in Los Alamos, New Mexico, focusing on Machine Learning and Computer Vision applied to satellite imagery. He focuses on building supercomputer-like clusters on cloud computer resources and running high performance computing software on cloud compute resources.

Gary Hoefs (BS '03) started a new job in 2016 as process analyst at CHS in Inver Grove Heights, MN, and is "loving it" so far.

Nick Lashinski (BS '15) is working as a Software Developer/Systems Analyst for SRF Consulting Group, a civil engineering firm in Plymouth MN.

Eric Markwardt (BS '88) is a Data Center Consulting

Systems Engineer for Cisco in Minneapolis, focused on pre-sales engineering activities that Leverage Cisco's Unified Computing and MDS storage solutions and architectures.

Siddharth Patwardhan (MS '03) and wife **Navdeep Kaur** (MS '03) recently moved to the Bay Area from New York. Sidd had been in IBM Research in Yorktown Heights, NY for the past seven years working on IBM's Watson Technologies. He is now at Apple in Cupertino, CA, working on Siri.

Mitchell Rysavy (BS '16) is Software Development Engineer at Amazon in New York City. He works for Shopbop, which is an Amazon subsidiary specializing in up-scale clothing.

Tim Schoenheider (BS '14) started as a systems engineer at Unisys doing mainframe development. He has since joined PeopleNet as a software engineer working on SaaS products, particularly containerization, micro-services, and frontend development.

Sue (Johnson) Swanson (BA '84) recently celebrated 25 years of service with Hazelden Betty Ford Foundation as a Senior Database Administrator.

David Van Loon (BS '15) is with Saturn Systems in Duluth, MN, working as a programmer intern.

Jeff Wagner (BS '01) is Chief Information Security Officer and Director of the Information Security Office for the United States Department of Agriculture, Farm Service Agency, based in Kansas City, Missouri. He also recently began a 3-year term as a member of the board of directors for Metro Lutheran Ministry, a faith-based social service non-profit, helping with cybersecurity audit recommendations and providing pro bono IT and cybersecurity consulting services. ■

Donate

If you would like to help defray the cost of education for worthy students, please consider donating to the UMD Department of Computer Science Scholarship Fund. Just go to <http://www.d.umn.edu/cs/gifts.html> and click **Computer Science Giving Page**.

Bulldog Bytes is conceived, written, and produced by **Tim Colburn** (tcolburn@d.umn.edu) with assistance from **Clare Ford** and **Lori Lucia**.