

CSE LINKS

[FACULTY RESEARCH]

KARTHIK DANTU IS GIVING LASER VISION TO ROBOT BEES

How do you teach robotic insects to see?

By equipping them with tiny laser-powered sensors that act as eyes, enabling the miniature machines to sense the size, shape and distance of

Un-BEE-lievable!



approaching objects.

“Essentially, it’s the same technology that automakers are using to ensure that driverless cars don’t crash into things,” says **Karthik Dantu**,

an assistant professor who joined CSE in 2013. “Only we need to shrink that technology so it works on robot bees that are no bigger than a penny.”

The UB-led research project is an offshoot of the RoboBee initiative, led by Harvard and Northeastern universities, which aims to create insect-inspired robots.

Currently, the bees are capable of tethered flight. But they lack depth perception. To address this, Dantu is equipping the bees with laser-based

[CONTINUE **ROBEBEES** PAGE 2]

How Might We Use These Mini Machines?

- 1 AGRICULTURE**
Imagine a swarm pollinating crops.
- 2 SEARCH-AND-RESCUE**
They could help find people during mudslides and other disasters.
- 3 INSPECTION**
They could be used to examine bridges and other hard to reach places.



ACTUAL SIZE
3cm



“The technology could have so many uses, which have the potential to help so many people in need.”

– **Karthik Dantu**, assistant professor

[FACULTY NEWS]



Govindaraju named VP for research and economic development

Longtime CSE faculty member **Venu Govindaraju** was named vice president for research and economic development at the University at Buffalo.

A SUNY Distinguished Professor of Computer Science and Engineering, Govindaraju’s appointment was announced in January by UB President Satish K. Tripathi and Provost Charles F. Zukoski.

“An internationally renowned expert in machine learning, pattern recognition and biometrics who has made transformative contributions to his field at a global level, Dr. Govindaraju

[CONTINUE **VP** PAGE 2]

[STUDENT NEWS]

Ready. Aim. Fire!

CSE STUDENTS ENERGIZE YOUNGSTERS WITH FUN STEM EVENT

You can tell kids that science and engineering is cool. Or you can show them.

A team of CSE students opted for latter, bringing a tennis ball shooting-cannon in April to Alden Middle School, where dozens of budding scientists learned basic scientific principles in a fun and engaging way.

“We wanted to use our class project to create something that could teach the youngsters basic science concepts in a fun and interesting way,” said CSE student **Jacob Rutkowski**.

He was joined by fellow CSE students **Ivaylo Parankinov** and **Zhen Rong Huang**, who helped the middle school-

[CONTINUE **SCHINDLER** PAGE 2]



From left, CSE students: **Jacob Rutowski**, **Bao Xu**, **Ivaylo Parankinov**, **Kris Schindler** (faculty advisor), **Joseph Morrello** and **William Clark**.

A Message from the Department Chair



Greetings alumni and friends, The rise of the centrality of computing makes this an exciting time for all of us working in the field of computer science and engineering.

At CSE@UB, we are experiencing tremendous growth. As you may know, we were one of the early departments in the nation to establish a degree program in computer science, and we are very proud of our outstanding alumni in computer science and computer engineering (from the previous CS and ECE departments to the current CSE department). For those of you who haven't visited UB lately, we now work in the new \$75 million Davis Hall, located where the trailers used to be. Next year will mark the department's 50th anniversary.

It is thus my great pleasure to bring you this edition of CSE Links, which spotlights the outstanding work our faculty, staff, students and alumni are engaged in. You'll also see some new faces. Please send us news about you and our alumni and we will be happy to include them in future editions (see Page 4 for contact information).

We are planning a multi-event 50th anniversary celebration. Activities will include a yearlong Distinguished Speaker Series from fall 2016 to fall 2017; a special commencement event for our "Gold" graduates in 2017; and the main gala from Sept. 28-Oct. 1, 2017. Please keep your calendar open for the gala. I personally invite each of you to join us as we carry on CSE's tradition of excellent scholarship and education. Also, if you have ideas and suggestions related to the celebration activities, or want to volunteer to help, please let us know.

As always, your support of CSE@UB is highly appreciated. Let us work together to strengthen the research and education programs, and improve the reputation and ranking, which will be beneficial to all of us.

Yours,

Chunming Qiao, PhD, IEEE Fellow
Professor and Chair

You can contact Dr. Qiao at qiao@buffalo.edu

WELCOME TO OUR NEW FACULTY AND STAFF



Marco GABOARDI
Assistant Professor

PhD, University of Torino and National Polytechnic Institute of Lorraine
Hobbies: Hiking, bicycling, travelling



Jesse HARTLOFF
Teaching Assistant Professor

PhD, University at Buffalo
Hobbies: Professional firework shooter, home brewing beer



Shi LI
Assistant Professor

PhD, Princeton University
Hobby: Visiting parks, zoos and attractions with family



Jackie MARTEK
Staff Assistant

MS, SUNY Buffalo State College
Hobbies: Reading, running



Aziz MOHAISEN
Assistant Professor

PhD, University of Minnesota
Hobby: Long-distance running



Edward SOBCZAK
Lead programmer/analyst

MA, University at Buffalo
Hobby: Playing the cello

[FROM **SCHINDLER** PAGE 1]

ers operate the cannon, and by **Joseph Morrello** and **William Clark**, who served on safety patrol, collecting the fired tennis balls and keeping the crowd away from the target.

All five said that they were influenced by

a teacher or other adult while in grade school and wanted to pay it forward for the next generation. They teamed up on the project as part of their computer engineering capstone design course, taught by **Kris Schindler**, teaching assistant professor in CSE.

[FROM **VP** PAGE 1]

has brought tremendous expertise to this position..." Tripathi said.

Govindaraju, who had served in the position on an interim bases since September 2014, has been the principal investigator or co-principal investigator on more than \$65 million in research funding. His work focuses on the application of machine learning and pattern recognition.

"Venu is an innovative scholar with an ambitious vision for UB's research enterprise," Zukoski said. "UB is fortunate to have an individual of such capacity in this important position."

A graduate of the Indian Institute of Technology in Kharagpur, India, Govindaraju received master's and doctoral degrees in computer science from UB.

[FROM **ROBEBEES** PAGE 1]

surveying technology called lidar. These systems are typically the size of a camping lantern. Dantu wants to make them much smaller.

To do so, he is creating novel perception and navigation algorithms that enable the bee to process and map the world around it. Meanwhile, University of Florida researchers are building tiny sensors for the bees. Harvard researchers will then incorporate the technology into the robots.

Dantu's work—reported on by Smithsonian Magazine, NBC News, IEEE Spectrum and dozens of other news outlets—may eventually be used in wearable technology, endoscopic tools, smartphones, tablets and other mobile devices.

Kid's Day brings 500 students to Davis Hall

EVENT ALIGNS WITH
WHITE HOUSE EFFORTS TO
PROMOTE STEM

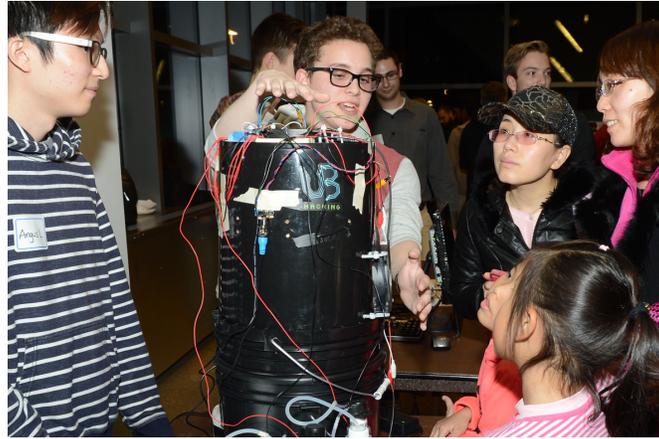
Roughly 500 students and their parents filled Davis Hall on Dec. 11 for a night of fun and games designed to celebrate and promote computer science.

Dubbed "CSE Kid's Day," the CSE event featured robot demos, games designed to teach programming concepts and kid-friendly interactive projects led by UB students.

The most popular spot for families with younger children was the third floor of Davis Hall, where youngsters could program robots to do fun things like follow a line, navigate a maze or dance.

"We got the kids excited by showing them various ways to write code and program a computer. Getting one of our robots to dance to music was very exciting for the kids," said **Bob DeBortoli**, a computer engineering major.

In another activity, kids played games that taught programming and com-



“Getting one of our robots to dance to music was very exciting for the kids!”
– **Bob DeBortoli**,
computer engineering major



puter science concepts without using a computer. Large squares were taped on the floor, and the children moved around the squares by following a series of prompts to sort numbers in increasing order.

"I liked the sorting games because we could participate in them and not just have someone showing it to us. It was a cool way to learn!" said **Aditi Arun**, a seventh-grader at Transit Middle School.

Kid's Day, which was part of UB's celebration of national Computer Science Education Week, aligns with a White House-sponsored initiative that aims to get more students learning how to code, program, script, design and harness the power of computing to solve new challenges.

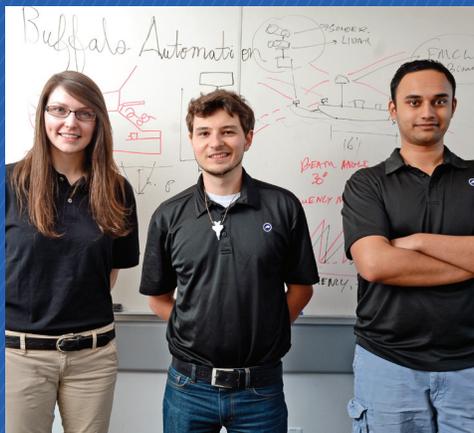
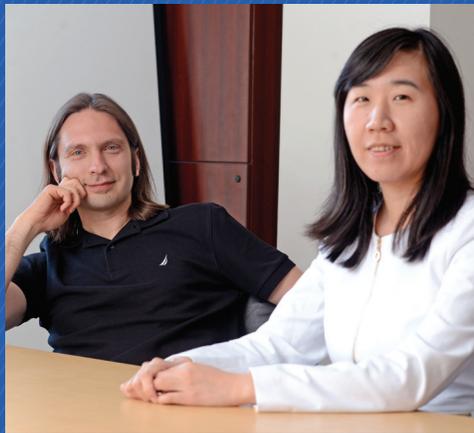
"I know that when I was growing up, I had no idea what computer science was all about," said computer science major **Meg Arnold**. "By opening up our department to the community, we can educate kids about computer science and hopefully spark their interest." 

FACULTY AWARDS

Jing Gao, *top right*, an assistant professor who joined CSE in 2012, has been awarded a CAREER grant from the National Science Foundation. The \$500,613 award will support her research, which focuses on developing new systems to accurately mine data from mobile devices, social media and other online platforms to provide inexpensive, sustainable and large-scale solutions that improve the efficiency and cost of transportation, health care and other industries.

Dimitrios Koutsonikolas, *top left*, assistant professor who joined CSE in 2011, has been awarded a CAREER grant from the National Science Foundation. The \$555,385 award will support his research, which focuses on developing next generation WiFi and cellular networks that aim to solve wireless traffic jams caused by the growing number of mobile devices and bandwidth-hungry applications.

Marco Gaboardi, assistant professor who joined CSE in 2015, has been awarded a \$527,867 grant from the National Science Foundation. The award, part of a larger grant involving researchers at Harvard University, involves creating a collection of tools that allow government agencies, banks, hospitals and other organizations to share valuable data without releasing personal information or other sensitive data.



STUDENT AWARDS

Thiru Vikram, *bottom right*, a former CSE and electrical engineering, is president and CEO of Buffalo Automation Group, a startup company that won UB's Henry A. Panasci Jr. Technology Entrepreneurship Competition in April. The company, which is making autonomous navigation technology for boats, will receive \$25,000 and another \$27,000 in in-kind services. It also includes SEAS students **Alexander Zhitelzef**, *bottom middle*, and **Emile Reynolds**, *bottom left*.

CSE established this year awards to recognize outstanding undergraduate students. Here are the inaugural class:

Leadership/Service award: **Gela Malek Pour** for her efforts to establish a local chapter of Scientista, a national organization that empowers pre-professional women in STEM, at UB.

Entrepreneurship award: **Thiru Vikram** for his work in establishing a promising startup company, Buffalo Automation Group.

Research award (two winners): **Paul Kowalski** for developing algorithms for constructing similarity graphs for massive DNA sequence data. **Vicky Zheng** for developing algorithms to identify a set of short protein sub-sequences for vaccine designs. 



University at Buffalo

Department of Computer Science and Engineering

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CSE is celebrating its 50th anniversary!

CSE50

1967-2017

Please keep your calendar open:

**SEPT. 28-
OCT. 1, 2017**

We are planning events that will highlight 50 years of excellence at CSE, and we want you join us. More details to come.

[SPOTLIGHT]



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ALUMNI NEWS

CSE alumnus **Dan Magnuszewski**, left, ('05, BS) spoke at Davis Hall on March 29 on what it's like to be an engineer navigating the world of tech startups. Magnuszewski is co-founder and CTO of Buffalo-based ACV Auctions, a dealer to dealer marketplace for used vehicles.

Fellow CSE alumnus **Bob Girardi**, right, ('79, BA), president and CEO of Amherst-based SofTrek Corp., also gave a seminar at Davis Hall. He spoke April 19 about agile software development, which is a set of principles in which requirements and solutions evolve through collaboration between self-organizing, cross-functional teams.



[VIEWS]



Nearly 50 years after its founding, CSE is stronger than ever, and our faculty and staff continues to grow. Here, the department poses outside of its home, Barbara and Jack Davis Hall on UB's North Campus.

ATTN: CSE ALUMNI

We want to hear from you! Keep us updated on your personal and professional lives.

Visit: bit.ly/28lqakd and complete the "STAY IN TOUCH" survey.



Also, please send in news, photos, videos, achievements, awards and more to cse-dept@buffalo.edu. We will include these items in upcoming newsletters! And don't forget to connect with our social media sites!

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