Points of Pride

$9.3 million
Ohio State CSE research expenditures in the 2018-2019 academic year

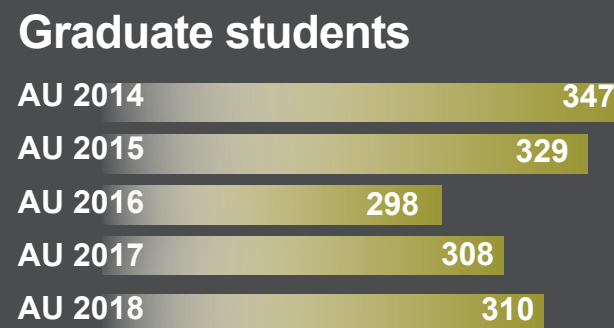## 31
NSF Career Awards held by CSE faculty

44
Tenure-track faculty members

1
Research-track faculty members

4
Clinical-track faculty members

7,900+
Ohio State CSE alumni worldwide

Computer Science and Engineering is the fastest growing department within the College of Engineering
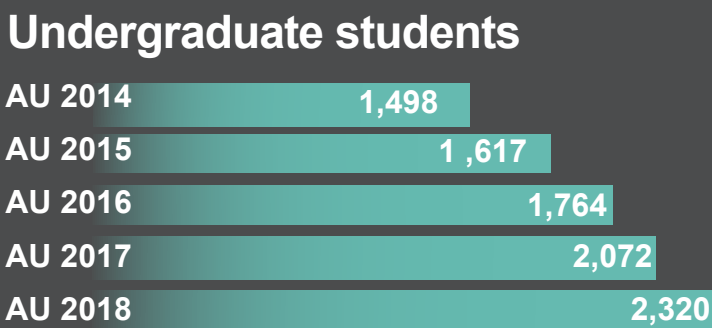
Degrees conferred

20	PhD
88	Masters
383	Bachelors

Summer 2018 - Spring 2019

Graduate enrollment

	PhD	MS
Total Number of Graduate Students (AU2018)	75	148
New Applicants 2018-2019	468	1,659
Number Admitted	60	250
Number Enrolled	35	98

Graduate students

AU 2014	347
AU 2015	329
AU 2016	298
AU 2017	308
AU 2018	310

Undergraduate students

AU 2014	1,498
AU 2015	1,617
AU 2016	1,764
AU 2017	2,072
AU 2018	2,320

The Undergraduate Programs in both CSE and CIS continue to grow even with enrollment management in place.

Department of Computer Science and Engineering

2019
Annual Report

From the Chair

Professor Tamal Dey

Dear CSE Alumni, Students, Parents, Friends, and Colleagues,

I became the interim Chair of the CSE department in Spring 2019. Assuming the responsibility of running one of the top Computer Science & Engineering departments without much preparation was a little overwhelming for in the beginning. Nonetheless, as I slowly immersed myself in the role, I found it rewarding to lead a top Computer Science department in a time when the field is experiencing a phenomenal growth. With the flourishing need of data processing in almost every sphere of today's life, Computer Science is going through transformative changes, which bring opportunities along with challenges. Determining those opportunities and aligning them with the Department and College's goals and can be realized with the available resources is a priority for me. In this respect, I briefly lay out what those opportunities are, what we have done so far, and what we can possibly do.

The growth in computer science is reflected in huge demand for undergraduate enrollment that exceeds 2,600 CSE, CIS and Data Analytics majors. Finding proper and sufficient resources to impart quality education to this growing number of future workforce continues to be challenging. Unfortunately, we are forced to increase some class sizes and cap enrollments in our majors. Increased alumnae (industry) support could give many more OSU students the quality CS education that was available to our alumnae.

One of the revenue sources for the department is the IDC generated by the external research funding by the faculty that has reached new heights in the past few years. To continue this growth the department needs to hire more faculty as it has been doing over the past few years. In the wake of a space and fund crunch, growing the faculty at the same rate may not be realistic. I remain hopeful that the ever-expanding engagements of faculty in research and developments and in seeking more funding from sources beyond the standard ones will mitigate the deficit to some extent.

Given that the state and federal assistance for absorbing the phenomenal growth in computer science has remained more or less flat over the years, it is time that we look for other avenues to meet the shortfall. One avenue will be to engage alumni and well-wishers of CSE to raise funds. In this respect, the 50th anniversary celebration of CSE's birth in this academic year is significant. The College advancement team in collaboration with us has launched a campaign to this effect. Our departmental webpage contains information about some of these efforts. I am hopeful that this campaign will motivate well-wishers of CSE to contribute at a time of need as the department celebrates its 50 years of contributions and service to the society in general.

This Autumn 2019 we are adding 5 new tenure track faculty— Wei Lun Chao, Pooya Hatami, Yu Su, Sailesh Boija, Tanya-Berger-Wolf and 2 Clinical track faculty—Thomas Bihari and Zahra Atiq Sayedah. The faculty and students are achieving new heights in research bringing national and international recognition some of which are highlighted in this annual report. We are training the future workforce for the digital age with quality education and serving the ever-increasing demand from the industry.

I am sure that "computing" will continue to take the center stage in advancing science and engineering and human society in general in coming years. With the support from the College, The Ohio State University and all of you we will continue to innovate and train to bolster and fuel this forward march.
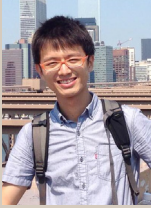

Connect, Sponsor and Engage with

Scholarship

Speaker

Partner

Intern

Mentor

Contributions

Capstone

Donate

Alumni

Sponsor

Hack OHI/O

Employee

Collaborate

New Appointments, 2018

Wei-Lun (Harry) Chao joined CSE as an Assistant Professor. His research interests are in machine learning and its applications to computer vision, autonomous driving, natural language processing, artificial intelligence, and health care.

Pooya Hatami is an Assistant Professor at The Ohio State University (OSU), with research interests in pseudorandomness, complexity theory, combinatorics, and analysis of boolean functions.

Yu Su is an Assistant Professor in CSE. Yu has broad interests in understanding human languages, formal knowledge, and their interplay. Specifically, he has been working on natural language interfaces for a wide range of backend data and services such as knowledge bases, web tables, and APIs.

Columbus Business First 40 under 40

CSE's own Dr. Arnab Nandi was selected as one of the 40 under 40 for the year. Nominated by College of Engineering's Associate Dean for Research Dorota Grejner-Brzezinska.

It was another record turnout for our longest-running awards program, now in its 27th year recognizing emerging talent in our community. We received 378 nominations this year, making our job even harder to narrow down that incredible pool of excellence to just 40 honorees.

Read the full story: go.osu.edu/40under40

Student Highlights

Grace Hopper Celebration

From September 26th to 28th, 2018, 49 Ohio State students attended the Grace Hopper Celebration of Women in Computing in Houston, Texas, supported by Ohio State's ACM-W chapter. Grace Hopper Conference (GHC) is an international technical conference highlighting and celebrating the achievements of women in the technology field, as well as empowering all minorities in tech to make a place for themselves in the tech industry. Full story: go.osu.edu/hopper_2018
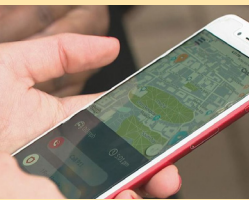
An Ohio State senior has created a personal safety app designed to keep people safe while walking alone.

Angela Rucci is the founder of Tego. The OSU student used her background studying computer science engineering to create the technology. "once you're in the app, you select where you're going, very similar to Uber and Lyft. And then you say who will be your notified contact or what we like to call your protector," explained Rucci.

Tego's founder and creator said the app allows users to state where they're going and estimates how long their trip should take. Users can also selected contacts to watch over them as they travel. When the user arrives to their destination safely, their contact is notified. Read more: go.osu.edu/tego
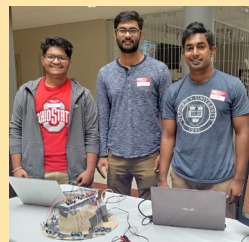
Undergrad team wins The University of Akron hackathon

The University of Akron held their annual hackathon the weekend on October 6th. Over 125 students and over 25 entries competed for a grand prize of $1000. The CSE Department was represented by a team of 3 undergraduate students, Karthik Pillalamarri, Jude Rajasekera and Pulkit Ayra. The team of three went into Hakron with the goal of creating a product that could have a positive impact in the real world. When team member Pulkit got soap in his eyes while showering, he realized how difficult it is to blindly navigate a world built for those with functioning vision, and so the idea for Super Sombrero was born. Get more information: go.osu.edu/ug_hakron

CSE Student selected as an Ohio State Sesquicentennial Scholar

Computer Science and Engineering Ph.D. student, Mohit Jangid, was recently named one of the Ohio State Sesquicentennial Scholars. Since our founding in 1870, Ohio State has empowered generations of Buckeyes to become leaders and create ideas that change the world. The Sesquicentennial Student Scholar Leadership Program builds upon this legacy by providing participants a $2,500 scholarship, leadership training and opportunities to serve as a university ambassador.
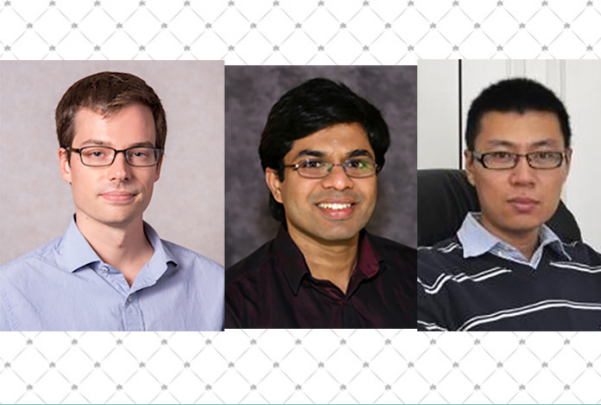
Research and Outreach

Three CSE members awarded The Lumley Engineering Research Award

The College of Engineering annually honors faculty, researchers and partners for outstanding teaching, research and outreach achievements.

"Without your hard work and dedication, we would not be able to educate the college's 10,000 plus students. We wouldn't have the discoveries, breakthroughs or innovations that help us engineer a better world and future," said College of Engineering Dean David Williams, Monte Ahuja Endowed Dean's Chair, while addressing event attendees. "Your talents, supported by over $150 million in externally sponsored research last year, influenced a broad range of applications and scientific disciplines."

The Lumley Engineering Research Awards are presented to a select group of outstanding researchers in the College of Engineering who have shown exceptional activity and success in pursuing new knowledge of a fundamental or applied nature. This year 3 of the 14 awardees are members of the Computer Science and Engineering department. Hari Subramoni, a research scientist; Dr. Alan Ritter, Assistant Professor; and Dr. Yingian Zhang, Assistant Professor.

Tamal Dey named ACM Fellow

Tamal Dey is among 56 of the leading computer scientists worldwide named as Fellows by the Association of Computing Machinery (ACM). ACM cited the award was given "for contributions to computational geometry and computational topology". ACM, the world's largest scientific and educational computing society, bestows their Fellow awards to a small and elite group of ACM members for their outstanding accomplishments in computing and information technology and in the large computing community.

"In society, when we identify our tech leaders, we often think of men and women in industry who have made technologies pervasive while building major corporations," said ACM President Cherri M. Pancake. "At the same time, the dedication, collaborative spirit and creativity of the computing professionals who initially conceived and developed these technologies goes unsung. The ACM Fellows program publicly recognizes the people who made key contributions to the technologies we enjoy. Even when their work did not directly result in a specific technology, they have made major theoretical contributions that have advanced the science of computing. We are honored to add a new class of Fellows to ACM's ranks and we look forward to the guidance and counsel they will provide to our organization." Read more: go.osu.edu/acmfellows

Two Best Paper Awards

Prof. Han-Wei Shen's research group has recently won two best paper awards in the IEEE VIS 2019 conference. One is the best paper award in the SciVis track, and the other is the best paper honorable mention award in the VAST track.

The first paper entitled "InSituNet: Deep Image Synthesis for Parameter Space Exploration of Ensemble Simulations", authored by CSE Ph.D. student Wenbin He, Prof. Shen, and their co-authors, proposed a deep learning model, named InSituNet, to support parameter space exploration for extreme-scale ensemble simulations.

In the second paper entitled "NNVA: Neural Network Assisted Visual Analysis of Yeast Cell Polarization Simulation", Hazarika et al. worked with computational biologists to create an interactive visual analysis framework to analyze the dynamics of a computationally expensive yeast cell polarization simulation model.

Bringing new perspectives to broad data science challenges

Three Ohio State research projects—each involving College of Engineering faculty—will receive $800,000 in TRIPODS+X awards from the National Science Foundation (NSF). Building on the success of its 2017 Transdisciplinary Research in Principles of Data Science (TRIPODS) program, NSF is awarding a total of $8.5 million in TRIPODS+X grants to 19 collaborative projects at 23 universities for 2018.

TRIPODS brings together the statistics, mathematics, and theoretical computer science communities to develop the theoretical foundations of data science through integrated research and training activities focused on core algorithmic, mathematical and statistical principles. The TRIPODS+X grants will expand the scope of these cross-disciplinary TRIPODS institutes into broader areas of science, engineering and mathematics. In the picture, (l to r) Tamal Dey and fellow TRIPODS researchers Yusu Wang, Facundo Memoli, David Sivakoff, Matthew Kahle and Sebastian Kurtek. Get more information: go.osu.edu/tripods18

CSE Assistant Professor Alan Ritter received a Faculty Early Career Development (CAREER) Award

CSE Assistant Professor Alan Ritter has received a Faculty Early Career Development (CAREER) Award from the National Science Foundation (NSF). The CAREER program is a Foundation-wide activity that offers NSF's most prestigious awards in support of early-career faculty. In conjunction with the award, Alan will receive $500,000 to support his research.

Alan's five-year project, entitled "Large-Scale Learning for Information Extraction", will substantially advance the capability of machines to read large document collections and reason about the knowledge contained within them using minimal human effort. This will help people to overcome information overload and make better decisions by analyzing vital information that is locked away in unstructured text. This research effort will support the rapid development of information systems for a broad range of new tasks and domains using minimal human effort.

Alan joined the department of Computer Science and Engineering in 2014. Prior to joining OSU, he was a postdoctoral fellow in the Machine Learning Department at Carnegie Mellon University. He received his Ph.D. in Computer Science from the University of Washington.
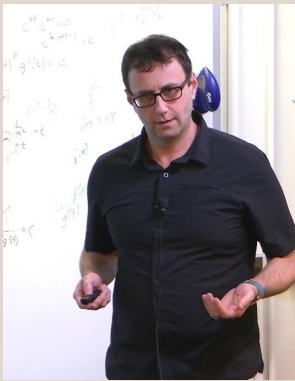
Learn more: go.osu.edu/career_ritter

Professor Mikhail Belkin published in PNAS

The paper titled Reconciling modern machine-learning practice and the classical bias–variance trade-off authored by Mikhail Belkin, Daniel Hsu, Siyuan Ma, and Soumik Manda was published in August 2019 in PNAS.

While breakthroughs in machine learning and artificial intelligence are changing society, our fundamental understanding has lagged behind. It is traditionally believed that fitting models to the training data exactly is to be avoided as it leads to poor performance on unseen data.

However, powerful modern classifiers frequently have near-perfect fit in training, a disconnect that spurred recent intensive research and controversy on whether theory provides practical insights. In this work, we show how classical theory and modern practice can be reconciled within a single unified performance curve and propose a mechanism underlying its emergence. We believe this previously unknown pattern connecting the structure and performance of learning architectures will help shape design and understanding of learning algorithms.

PNAS is one of the world's most-cited and comprehensive multidisciplinary scientific journals, publishing more than 3,200 research papers annually. The Proceedings of the National Academy of Sciences (PNAS), the official journal of the National Academy of Sciences (NAS), is an authoritative source of high-impact, original research that broadly spans the biological, physical, and social sciences. The journal is global in scope and submission is open to all researchers worldwide. Read more: go.osu.edu/belkin_pnas

Alumni and Innovation

SIGMOD Contribution Award

CSE Alumni Ahmed Elmagarmid recieved the SIGMOD Contribution Award by an unanimous decision. Ahmed Elmagarmid recieved the award especially for his dedicated service to the database community in North America and the Middle East, as the founder/editor of Distributed and Parallel Database Journal, and PC for ACM SIGMOD.
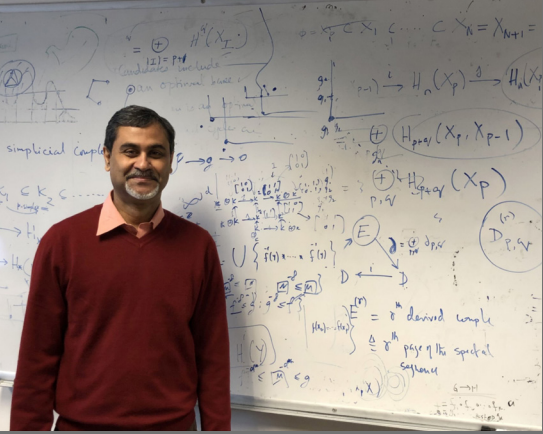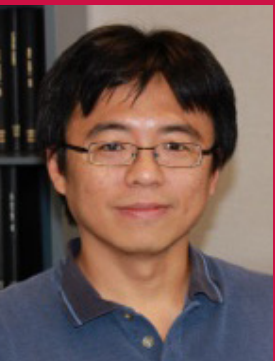
Ahmed Elmagarmid is the founding executive director of the Qatar Computing Research Institute and is an Emeritus Professor of Computer Science at Purdue University. He served as Chief Scientist at Hewlett Packard and Chief of Data Quality at Bellcore. Dr. Elmagarmid is a recipient of the NSF Presidential Young Investigator (PYI) award from President Reagan in 1988. He is an IEEE Fellow, an ACM Fellow and an AAAS Fellow. The University of Dayton and The Ohio State University have both named him among their distinguished alumni. His claim to fame is that he shared an office as graduate student with Prof. M.T.Ozsu.

Distinguished Engineering Alumni Award

Rick Parent who received his MS and Ph.D. in CSE at the Ohio State University in 1973 and 1977 respectively, recieved the Distinguished Engineering Alumni Award. Rick was a CSE professor from 1985-2012, and remains as Professor Emeritus in the department. Rick has been recognized as a Computer Graphics Pioneer by ACM SIGGRAPH, which is a high honor in computer graphics field. His book of Computer Animation: Algorithms and Techniques is the book in the field, and has been translated into 4 different languages, including Chinese, French, Polish, and Russian. It is also the only book on Computer Animation for students, researchers, and practitioners in the world. Publisher Morgan Kaumann promotes Rick's book as the best technically-oriented animation resource.

Read the fully story online: go.osu.edu/parent18

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