COMPUTER SCIENCE & ENGINEERING

UNIVERSITY *of* WASHINGTON

Computer science and computer engineering are changing the world.

UW CSE is driving this revolution.

University of Washington Computer Science & Engineering is revolutionizing the field of computing, driven by a powerful vision of its expanding role in the modern university and in the modern world. We are one of a small number of preeminent programs in the nation, recognized globally for the quality of our teaching and research.

OUR IMPACT

UW Computer Science & Engineering is dramatically expanding our impact on Washington's students, innovative employers and economy — and developing solutions to some of society's greatest challenges.

EDUCATING THE NEXT GENERATION OF INNOVATORS

UW CSE prepares Washington's students for Washington's leading-edge jobs. We are *by far* the top supplier in the state of computer science graduates to innovative companies of all sizes. We empower our students to think globally and to apply computer science and computer engineering to improving quality of life for people around the world.

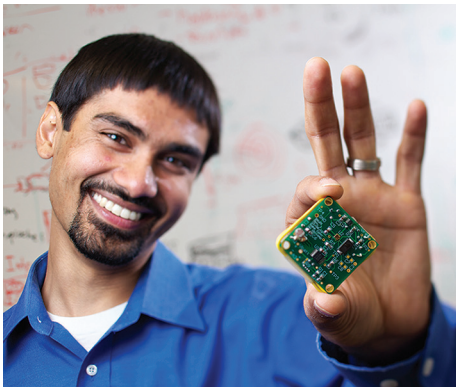### BREAKING DOWN BARRIERS TO BROADEN PARTICIPATION

UW CSE is committed to broadening participation in computing among under-represented groups and to mentorship, collaboration and service. We demonstrate this commitment every day through robust outreach programs and partnerships that enable students to participate in groundbreaking research, expand opportunities for K-12 students and teachers, and promote entrepreneurial success.

University of Washington
Computer Science & Engineering
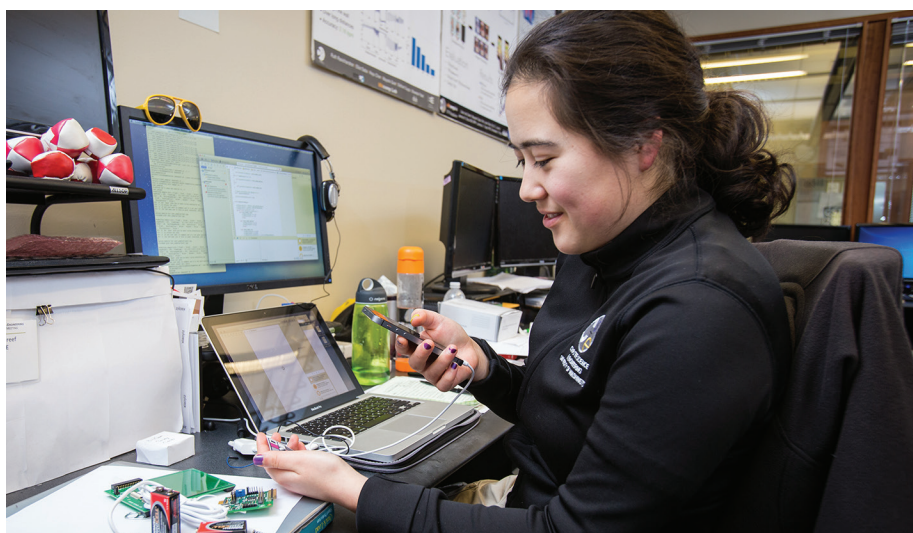
UW CSE AT A GLANCE

First established in 1967 as the Computer Science Group, Computer Science & Engineering has evolved into one of the University of Washington's most outstanding units, with more than 50 faculty and 75 staff.

Consistently ranked among the top 10 programs in the nation, UW CSE produces highly effective graduates, conducts high-impact research, engages broadly in interdisciplinary initiatives and in the community, and is active in technology transfer, company creation and entrepreneurship. We compete with only a handful of other top programs to attract the very finest faculty, students and postdoctoral researchers while remaining true to our mission as a unit of Washington's flagship public university.
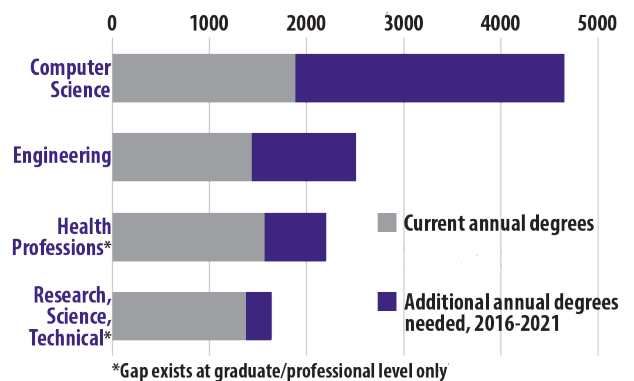
EDUCATING WASHINGTON'S STUDENTS FOR WASHINGTON'S LEADING-EDGE JOBS

UW CSE is *by far* the top supplier in the state of computer science graduates to innovative companies of all sizes. More than 3/4ths of our students are Washington residents, and the vast majority of our graduates remain here after obtaining their degrees. The opportunity for our citizens is great: Washington's projected workforce gap in computer science exceeds the next three high-demand fields, combined. Nationally, 71 percent of all new STEM jobs in this decade are projected to be in computing.

While we have expanded in response to growing demand, granting 364 degrees in 2014–15, we are able to accommodate only 1/3rd of qualified UW students who apply to the major. We also face growing demand across the campus: we enrolled nearly 5,000 students in our introductory courses during the past year, and the demand for upper-division courses from students in other fields is also rapidly increasing.

WASHINGTON'S STEM WORKFORCE GAP BACCALAUREATE LEVEL AND ABOVE

Washington Student Achievement Council, State Board for Community & Technical Colleges, Workforce Training & Education Coordinating Board

Current annual degrees

Additional annual degrees needed, 2016-2021

*Gap exists at graduate/professional level only

PUSHING BOUNDARIES, CHANGING THE WORLD

UW CSE faculty and students are not just pushing the boundaries of the field: they are producing innovations that have the potential to change the world. We are at the forefront of data science, machine learning, natural language processing, computer vision, human-computer interaction, programming languages and software engineering, privacy and security, and wireless and sensor systems — and we are applying this expertise to some of humanity's greatest challenges.

TECHNOLOGY FOR GLOBAL DEVELOPMENT

UW CSE researchers developed a set of open-source, mobile data collection tools, the Open Data Kit, for use in low-resource settings. ODK is currently being used to advance public health, environmental stewardship and humanitarian causes in countries around the globe.

CROWDSOURCING SCIENTIFIC DISCOVERY

UW CSE's Center for Game Science pioneered citizen science through gaming, with remarkable results. Players of our protein folding game, FoldIt, helped solve a scientific mystery by successfully modeling the structure of an enzyme that could lead to novel treatments for AIDS — and they did it in just three weeks.

Above:

Professor Shwetak Patel displays an ultra-low-power sensor developed in the Ubiquitous Computing Lab. UW CSE faculty and students are using these novel sensors to develop new solutions for mobile health care, sustainability, home networking and many other applications that are enabling the Internet of Things.

Front cover:

Ph.D. student and Ubiquitous Computing researcher Lilian de Greef works on BiliCam, a smartphone-based system for monitoring jaundice in newborns.

A RECOGNIZED LEADER IN BROADENING PARTICIPATION IN COMPUTING

UW CSE is leading the way in promoting diversity in our field by reaching out to women, people of color and people with disabilities.

INCREASING GENDER DIVERSITY

We set out to address the gender disparity in computer science education by building a welcoming and supportive community and by making a concerted effort to recruit talented women as students and faculty. Designated a Pacesetter School by the National Center for Women & Information Technology, UW CSE was recognized with the inaugural NCWIT Extension Services Transformation (NEXT) Award in 2015 for our efforts to increase the participation of women in undergraduate computing. At our 2015 graduation ceremony, we granted roughly 1/3rd of our computer science bachelor's degrees to women — more than twice the national average.

ENGAGING UNDER-SERVED COMMUNITIES

We worked with Rainier Scholars, a local academic enrichment program, to design and implement a computer science course for eighth grade students of color. We co-founded the University's AccessComputing Alliance to enable students with disabilities to successfully pursue computer science degrees. And we established the Taskar Center for Accessible Technology, which engages faculty and students in the development of technology solutions for people with mobility impairments by working directly with users and caregivers.

NURTURING THE NEXT GENERATION OF SCIENTISTS AND ENGINEERS

Through our robust K-12 outreach program, DawgBytes ("A taste of CSE"), UW CSE works with teachers across the state to incorporate computer science into their classrooms and organizes campus activities to inspire the next generation of computer scientists and engineers.

INSPIRING STUDENTS

Our summer day camps provide students in grades three and up with an opportunity to explore the field of computing and to acquire programming skills. We offer both co-ed and girls' sessions, exposing several hundred campers each summer to the wonders of computer science through games, hands-on projects and interactions with UW CSE faculty and students.

EMPOWERING EDUCATORS

We invite middle and high school teachers to campus every summer for CS4HS, a professional development workshop that helps math and science educators to integrate computer science into their classroom teaching and build student interest in this rapidly growing field. Since CS4HS launched in 2007, nearly 500 Washington teachers have participated in these workshops.

Professor Ed Lazowska, Director of Student Services Crystal Eney, and lecturers Allison Obourn and Ruth Anderson accept the NEXT Award grand prize from NCWIT.

UW CSE organizes local activities to coincide with the annual Grace Hopper Celebration of Women in Computing and sends dozens of undergraduate and graduate students to the national conference each year.

Kids attending Engineering Discovery Days are greeted in the Allen Center by Hobbes, a PR2 robot from Professor Joshua Smith's lab.

THE CAMPAIGN FOR CSE

Computer science as a field has become a cornerstone of the modern university and of the modern world. At the University of Washington, computer science is impacting nearly every field: from sociology to astronomy, from psychology to economics, from oceanography to medicine, from neuroscience to law, from business to global health. Computer science is also transforming our industrial base and driving our state economy: in addition to home-grown companies of all shapes and sizes, more than 50 technology companies headquartered elsewhere have opened major R&D centers in and around Seattle — and a relationship with UW CSE is a major attraction for these companies.

UW CSE has a clear vision for the future, and we are marshaling the good will and resources of our friends, alumni and leaders in the innovation community to help us achieve that vision. Together, we can assure Washington's future position as a global center of innovation.

BUILDING FOR OUR FUTURE

We are forging a public-private partnership to assemble $110 million in funding for the construction of a new 130,000-square-foot building on the University of Washington's Seattle campus. This state-of-the-art facility will complement the Paul G. Allen Center for Computer Science & Engineering and accommodate UW CSE's recent and future growth. The Allen Center was a game-changer for our program, our university and our region when it came online in 2003. Twelve years later, we have a new opportunity to catapult UW CSE forward.

INVESTING IN OUR PEOPLE

We aim to grow UW CSE's endowment to $150 million, an increase of $100 million over the current level. This will provide approximately $6 million per year to recruit and retain world-class faculty, educate more Washington students regardless of their means, and attract the best and brightest graduate students and postdoctoral researchers to our state. When combined with increased physical capacity and planned strategic investments by the state, these resources will enable us to dramatically expand our research enterprise, double our degree production, and significantly increase education offerings to non-CSE majors — preparing more of Washington's students for Washington's leading-edge jobs, in an ever-broadening array of fields.

EXPANDING OUR LEADERSHIP

UW CSE has more than outgrown our space — we have outgrown our position in the university. We intend to turn a great Department of Computer Science & Engineering into a world-class School of Computer Science & Engineering. This strategic move will provide us with greater visibility and autonomy, and a level of flexibility that will enable us to be even more nimble and even more impactful in defining the forefront of our rapidly advancing field.

Our goals are both *unabashedly ambitious* and *attainable*. Join us! Contact Ed Lazowska to learn more and to join us in this vital effort to shape the future of UW CSE at lazowska@cs.washington.edu.

"What really sets UW's computer science program apart are the people – the faculty and the students. The Allen Center is a wonderful home for the program, but at the end of the day it's the excitement, intelligence and innovation of the men and women in this organization that make it what it is."

—Paul G. Allen, at the 2003 dedication of the building that bears his name