

DESIGNING UP

A PUBLICATION OF THE DEPARTMENT OF HUMAN CENTERED DESIGN & ENGINEERING
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HUMAN CENTERED DESIGN & ENGINEERING
UNIVERSITY of WASHINGTON

HCDE ACADEMICS

HCDE students learn to prioritize human needs and interests as they design and build solutions to global challenges

BACHELOR OF SCIENCE IN HCDE

The Bachelor of Science in HCDE enables students to build a strong foundation in designing user experiences and interfaces, creating information visualizations, conducting user research, designing for the web, and building web technologies through a deep understanding of people and their contexts. Students graduate from the program with engineering degrees. More at hcde.uw.edu/bs.



MASTER OF SCIENCE IN HCDE

The Master of Science (MS) in HCDE prepares students for professional and leadership roles in user experience research and design, interface design, interaction design and prototyping, product design, human-computer interaction, human centered engineering, and program management. HCDE MS courses are offered in the evening to accommodate a diverse cohort of full time and part time students. More at hcde.uw.edu/ms.



CERTIFICATE IN USER-CENTERED DESIGN

The User-Centered Design (UCD) Certificate is an evening, graduate-level program for professionals who want to explore a wide range of issues in user-centered design. Students learn methods for planning and developing intuitive, user-friendly product designs. This four-course certificate focuses on usability studies, user-centered design theories, visual communication and information visualization, and web design. More at hcde.uw.edu/ucd.



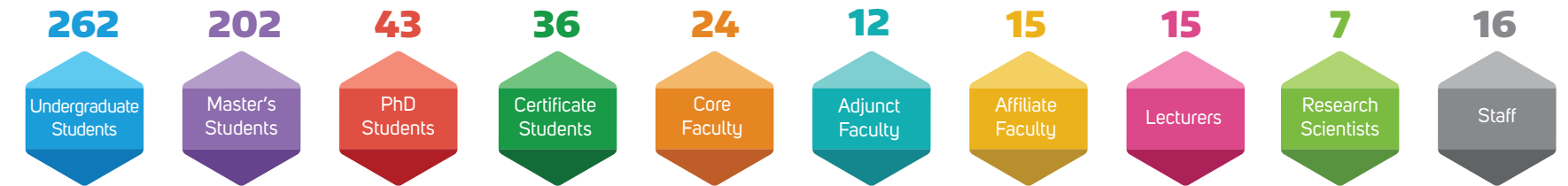
DOCTOR OF PHILOSOPHY IN HCDE

The Doctor of Philosophy (PhD) in HCDE provides unparalleled depth and experience for students interested in studying the conception, design, implementation, evaluation, and effects of technologies. The HCDE doctoral program prepares students for careers as scholars and researchers through relevant coursework, mentorship from faculty, and collaboration with peers. More at hcde.uw.edu/phd.

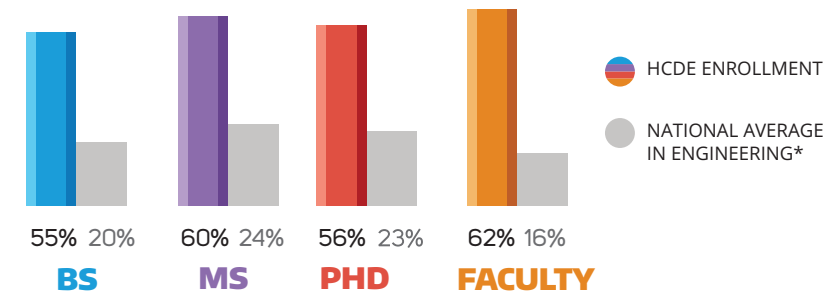


OUR PEOPLE

Demographic data from the 2017-2018 academic year in the Department of Human Centered Design & Engineering

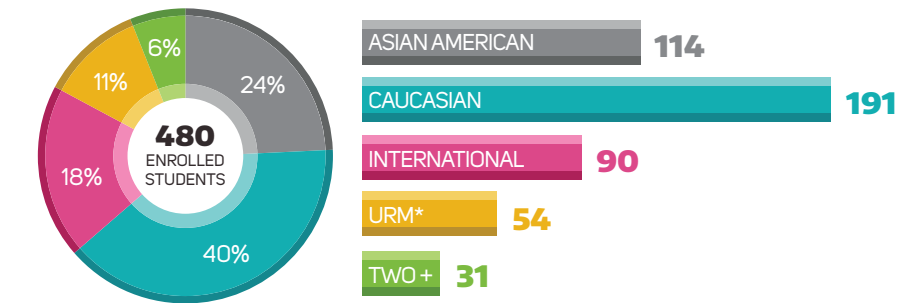


WOMEN IN HCDE



* Source: National Science Foundation, National Center for Science and Engineering Statistics. Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017.

RACE & ETHNICITY IN HCDE



*URM (underrepresented minority) includes federally recognized underrepresented minority populations: African American, American Indian/Alaska Native, Hawaiian/Pacific Islander and Latino.
*Two+ includes students who identify as two or more races.

STUDENT & FACULTY BACKGROUNDS

HCDE is an interdisciplinary community that brings together faculty and students from a variety of backgrounds. The most common HCDE backgrounds fall within:

- SOCIAL SCIENCES
- COMPUTER SCIENCE
- ART, MEDIA & DESIGN
- INFORMATION & COMMUNICATION



DEGREES AWARDED IN 2016-2017 AY



A GROWING HCDE CURRICULUM

In the 2017-2018 academic year, HCDE launched a new Data Science specialization for undergraduate students, and several new elective courses

NEW DATA SCIENCE SPECIALIZATION

A Data Science specialization is now a transcriptable degree option for HCDE undergraduate students.

The emerging field of Data Science encompasses a broad set of interdisciplinary skills including data management, programming, statistics, machine learning, visualization, and human-centered design. In today's workforce there is increasing demand for a new class of data scientists with expertise in managing, modeling, and visualizing the massive, noisy, and heterogeneous datasets that arise across many areas of science and industry.

The University of Washington has become a leader in the inclusion of human-centered skills in Data Science curriculum. The new Data Science degree option will educate students in all aspects of the field of Data Science, increase their marketability in the workplace, and enable them to contribute to solutions to the many critical data-intensive problems in the world today.

Students have the option to specialize in either the Human-Computer Interaction or Data Science degree option. **More at hcde.uw.edu/bs/ds.**

INCLUSIVE TECHNOLOGY DESIGN

NEW COURSE

This course is an introduction to designing, prototyping, and evaluating inclusive user interfaces that meet the needs of a diverse range of users—such as older adults, users with visual, cognitive or motor impairments, and users who are deaf or hard of hearing. Building on basic concepts in human-centered design, students learn about design exclusion and barriers to use, and methods by which these can be overcome.

INTRODUCTION TO COMPUTATIONAL CONCEPTS

NEW COURSE

This course introduces students to the basics of programming and computing. It gives students hands-on learning experiences with the fundamentals of programming using a combination of demonstrations and exercises. Students learn how to create standalone, interactive programs using the same computational concepts and techniques used by development teams.

COMMUNICATION WITH VIDEO

NEW COURSE

This course introduces students to the basics of storytelling and video prototyping for design projects. The course includes basic technical instruction on video editing and assignments that help students gain technical skills, however, the emphasis of this class is on the conceptual side of constructing compelling stories to convey design ideas.

WELCOME NEW FACULTY

Three faculty members joined HCDE in the 2017–2018 academic year, expanding the department's expertise in areas of accessible and inclusive design, digital fabrication, and engineering communication



DR. LEAH FINDLATER ASSISTANT PROFESSOR

Dr. Findlater directs the Inclusive Design Lab, whose mission is to lower barriers to technology use and information access for users with a range of physical, sensory, and cognitive abilities. She holds an NSF CAREER Award and her research is funded by NSF, the Department of Defense, Nokia and Google. Before joining HCDE, Dr. Findlater was on the faculty at the University of Maryland's College of Information Studies, and spent two years as an NSERC Postdoctoral Fellow at the UW Information School. Dr. Findlater holds a PhD in Computer Science from the University of British Columbia.

DR. DIANNE HENDRICKS LECTURER

Dr. Dianne G. Hendricks directs the Engineering Communication Program for the College of Engineering, in which she develops communication curriculum for all Engineering students, and teaches ENGR 231, Introduction to Technical Communication. Dr. Hendricks joined HCDE from the department of Bioengineering, where she taught courses on technical communication, introductory engineering, ethics and social justice in engineering, and service learning. Dr. Hendricks holds a PhD in Genetics from Duke University.



DR. NADYA PEEK ASSISTANT PROFESSOR

Dr. Nadya Peek's work focuses on unconventional digital fabrication tools, small scale automation, networked control systems, and advanced manufacturing. Spanning electronics, firmware, software, and mechanics, her research focuses on harnessing the precision of machines for the creativity of individuals. Before joining HCDE, Dr. Peek was a postdoctoral research scientist at the MIT Center for Bits and Atoms. Dr. Peek holds a PhD in Media Arts & Sciences from the Massachusetts Institute of Technology.

HCDE CONNECTING GENERATIONS

Mother-daughter pair of HCDE alumni reflect on finding the department and their careers since graduating

Mother-daughter pair Annica Garfield and Connie Missimer graduated with master's degrees from the Department of Human Centered Design & Engineering fifteen years apart. Since graduating in 2002, Connie has worked in leadership roles in User Research for Microsoft and AT&T, and published her second book about critical thinking. Today, she owns a company focused on helping companies apply critical thinking to the workplace. Annica graduated from the department in 2017 and now works as a User Experience Designer for REI.

We caught up with Annica and Connie to hear about their experience in the department and their career paths since graduating.

What led you to enroll in the HCDE program?

Connie: My background is in philosophy, so after I graduated from college I went in that trajectory – I did graduate work at UC Berkeley, I started teaching, and I wrote a book about

critical thinking. I was, and have always been, very interested in using science and empirical evidence to understand how people think and operate. I was interested in breaking into the corporate world, and came across this department called Technical Communication, and it was intriguing to me. I am thankful for two amazing instructors I had while in the program – Judy Ramey and Erin Schulz – who both had a big influence on me and helped me discover my love of this field.

Once I enrolled in the program and took Judy Ramey's Usability Studies class, I thought – 'This is empirical heaven. This is really what I want to do!' I was excited to work on solving complex problems that can really help people and improve their experience in the workplace.

Annica: I graduated from UW with a degree in biology. After volunteering in a lab for a while, I realized that I wanted more of a direct connection with the impact of my work, opposed to the down-the-line impact that tends to come with scientific research and



Connie Missimer (MS '02) and Annica Garfield (MS '17) at the HCDE Alumni BBQ in Sept. 2017

discovery. I knew I liked research and I liked science, so my mom connected me with her colleague Erin Schulz, her former instructor in the department, who now runs a company called LaunchBox.

I was fortunate to get hired as a research assistant with Erin at LaunchBox, doing a mix of market research and usability. Like my mom, I thought – 'Wow, this is really fun!' I was doing research, and I was connecting with the people I stood to impact through research interviews and the subsequent experience improvement recommendations. I knew I would need more training if I wanted to advance my career in that direction, so I did some research on what the HCDE program looked like now, and applied.

Tell us about your careers since graduating from the department.

Connie: I worked with Erin at LaunchBox, and I worked at a few other startups until I was hired at Microsoft in 2003. At Microsoft I worked for eight years doing User Research in the tablet group and Windows. Then, I moved to AT&T as a senior manager of devices where I advised product manufacturers about better practices for software applications.

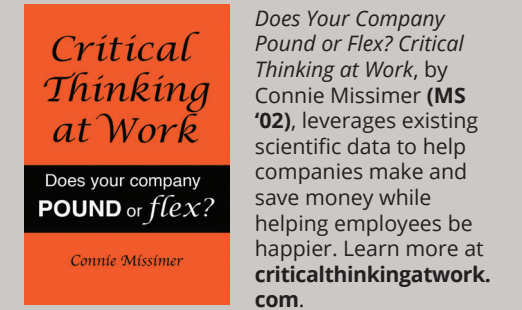
Annica: I was working at the Seattle REI store while I was in grad school. I was able to get an internship on the REI UX team over the summer, which was then extended and converted into a full-time role. And I've been with REI ever since. Now my role is as a User

Experience Designer, and even though I have designer in my title, the job entails a lot of research.

What are you working on now?

Annica: Right now I'm working on a research project to understand the end-to-end customer experience of the REI Adventures program. I love working at REI because I work with such kind, talented people, and the work is always new. One day I can be researching how to better serve our ski customers, and the next looking at what our membership experience looks like. REI's values so clearly match my own that is hard to imagine working anywhere else – There are very few companies that I can so fully get behind what they do and what they stand for.

Connie: I left AT&T a year ago to start my own business, Critical Thinking at Work, where I do training and consulting for employers including people at Google, Edward Jones, and Microsoft. I recently wrote a book, *Does Your Company Pound or Flex? Critical Thinking at Work*, and I'm teaching online courses with O'Reilly Publishers about critical thinking in the workplace. This has to do with taking an empirical look at the workplace, and using the best data from the brain and social sciences, to



help companies make more money and at the same time make employees happier.

Actually, Annica helped connect me with the O'Reilly Media folks, after she met them at a UXPA conference! She said, "Hey! My mom is writing a book about critical thinking, maybe she would be a good teacher for an O'Reilly class on the topic."

Annica: Yeah, well it was my turn to return the favor for connecting with me to the department!

Connie: That's right! We really are just going to bootstrap each other up to the sky.

Do you have a story to share with HCDE? Please let us know! Contact Leah Pistorius at lepisto@uw.edu.

BUILDING CONNECTIONS

HCDE team is pairing the University's food waste with community agencies in need

In HCDE Lecturer Irini Spyridakis' course on advanced communication in HCDE, she asked students "If you had a million dollars, what kind of project would you do for social good?"

Madison Holbrook, at the time a junior in HCDE, immediately knew her project would focus on the area of food recovery. "I grew up on a farm," Holbrook explained. "There was no shortage of food. But when I moved to Seattle, I saw that there was a huge disconnect between food going to waste and people struggling with food insecurity." For Spyridakis' course, Holbrook proposed a website that would pair campus dining halls with local shelters and non-profits to coordinate food recovery.

Spyridakis (**MS '10**) encouraged Holbrook to take the concept further, and the pair wrote a proposal to the Campus Sustainability Fund. Their project was awarded \$17,000 to support a team of student designers and developers in the creation of an open source website to connect leftover dining hall food with non-profit agencies.

To facilitate this, Holbrook and Spyridakis co-led a two-quarter Directed Research Group with students from HCDE, Computer Science, and the iSchool, to research, design, and develop the concept to a fully functional website.

The platform was designed for and with the help of three groups: dining halls (food providers), shelters (food receivers), and student groups (food transporters). Through the website, when the dining hall knows they have excess food, they schedule the student group for pickup. The dining hall can also communicate directly with the shelter for an emergency pickup, when they can't house the excess food.

In May 2018, the first pilot is launching between UW Local Point dining hall, Union Gospel Mission and Compass Housing Alliance, and student groups Green Greeks and the Carlson Center Service Learners. The team will study the process, including analyzing how much money is saved by diverting food from the compost facility,



Students in the two-quarter Directed Research Group designed and developed a website to pair excess food from campus dining halls with local non-profit agencies.

with the goal of using the savings to support a staff position. Holbrook looks forward to scaling the project up to other campus food providers, as well as other universities.

"For me, the best part of this project is the feeling of knowing you can dream up an idea, communicate it, find people who are interested in it, and develop something that will actually help people," Holbrook said.

"For a long time, it was just pen and paper, meetings and designing, but now that this is a thing that exists in the world, we are able to connect food that would otherwise be wasted with people who could use it. It feels great."

TECHNOLOGY FOR BETTER DECISIONS

New research aims to help people make better decisions by communicating uncertainty in predictions

Today's smartphones give people a way to quickly use predicted information to make everyday decisions, from deciding what to wear for the day based on weather prediction, to deciding when to buy an airplane ticket based on price predictions. But with every prediction there is a degree of uncertainty that is not communicated to the decision-maker.

A team of researchers at UW and the University of Michigan want to help people understand just how much uncertainty is within the predictions they see on their phone, to help people make the best decision possible.

Michael Fernandes (**BS '17**) is the lead author on a paper about this research, which received a Best Paper Honorable Mention award at the 2018 CHI conference on human-computer interaction. "Previous research shows that more and more people are making these quick decisions with predictive apps," Fernandes said. "We want to figure out the most effective way to communicate uncertainty to the average person, and not just to those who are literate in statistics."

To study this, Fernandes and the research team conducted a controlled experiment to study how people make decisions about when to catch their bus. The team used a modified version of OneBusAway, a real-time bus arrival time application widely used in Seattle. Fernandes used the user-centered design process to design and rebuild OneBusAway, modified to incorporate uncertainty information.

The researchers asked participants to complete multiple tasks, each representing a single decision about when to arrive at the bus stop given a realistic scenario, and participants used one of ten different "uncertainty displays" to make their decision about when to catch the bus. The researchers found that two types of displays, quantile dotplots and cumulative distribution plots, both led people to make better decisions.

"This work is exciting to me when I think about how it can be scaled," Fernandes said. "More than just helping one person making a decision, when you think about how technology can help



The phone on the left shows the current OneBusAway app used in Seattle as of September 2017, displaying predicted departures for an individual bus stop. The interface on the right is the rebuild created by the researchers, using quantile dotplots to display uncertainty.

everyone make better decisions, you can help make a lot of lives easier."

Co-authors on this paper are Sean Munson, associate professor in HCDE; Logan Walls, UW iSchool alumnus; Jessica Hullman, assistant professor in the UW iSchool; and Matthew Kay, assistant professor at the University of Michigan.

POWERING THE FUTURE OF HCDE

Jill DeMarco (MS '96) and Dr. Rodney Wentworth are establishing an endowed fellowship for HCDE

The Department of Human Centered Design & Engineering is receiving its largest estate commitment to date from alumna Jill DeMarco (MS '96) and her husband Dr. Rodney Wentworth. Through their estate plans, Demarco and Wentworth are establishing an endowed fellowship to provide financial support to HCDE undergraduate and graduate students. Their gift will equally support the UW school of dentistry, of which Dr. Wentworth is an alumnus (DDS '81).

Now happily retired, Jill DeMarco had a successful career working in technical communications for the Federal Aviation Administration (FAA) and then at Boeing. The FAA funded her master's degree from the department (then called Technical Communication) while she was working there writing airline regulations, and DeMarco wants to pay it forward.

After graduating with her MS in Technical Communications, DeMarco continued her career in airline regulations, this time from the industry side as a Program Manager at Boeing — working to implement the very regulations that she wrote at the FAA. DeMarco credits much of her career

success to instructors she had in the department who taught her to look at problems holistically.

DeMarco has fond memories of several of her instructors from the department, particularly Professors Judy Ramey and Mary Coney.

"In Professor Mary Coney's class, she really helped us to understand communication from a complete meta view. She helped us see that we can get a lot more by stepping back, looking at the whole picture, and connecting the dots accordingly," she described. "What Professor Coney taught me has really helped me many times throughout my life — it has encouraged me to pause and reflect, and see where everything fits in. Professor Judy Ramey was really skilled at doing the same thing, on a technical level."

DeMarco wants future HCDE students to have the same good fortune she did when she went through school.

"I was very lucky as an undergraduate student that my parents worked hard and were able to put their four kids through college. And, I was lucky again working for the FAA, where if you were accepted to a graduate program they



Dr. Rodney Wentworth and Jill DeMarco (MS '96) visiting the UW campus in January 2018

would reimburse you for tuition. I understand how hard the burden of student loans can be, and that's why I asked that my gift be directed toward students who are in need of tuition funds. I want to help alleviate some of the stress that comes from being in debt."

Today, DeMarco is enjoying her retirement, and finding time for exercising, reading, taking classes in languages, and traveling. Dr. Wentworth teaches courses for the Department of Oral Medicine.

Gift from Devindra & Manisha Chainani Supports Capstone and Alternative Spring Break Program

A donation by Devindra & Manisha Chainani supports the HCDE Excellence Fund's capstone award program to benefit students in the HCDE required capstone course. Capstone-related costs such as incentives for user research studies, purchasing materials for prototypes, and printing, can be a burden on economically disadvantaged students in particular.

In addition, the Chainani's gift allows HCDE to significantly expand its Alternative Spring Break program, operated in conjunction with the UW Pipeline Project. The program is intended to help students in remote areas of Washington to see themselves pursuing higher education, and to learn how studying engineering at UW could enable them to live and thrive in their home communities after graduation.

For Mr. Chainani, helping equip the next generation of designers with the tools necessary to solve global challenges is his passion. Mr. Chainani has been supporting University programs for over twenty-five years, spanning the Jackson School for International Studies, the Foster School of Business, the Information School, and HCDE. Now a Principal Group Manager at Microsoft, Mr. Chainani manages a team of program managers in the engineering team for Microsoft Teams and Microsoft Skype for Business.

Lynne and Richard Croft Establish William S. Croft Endowed Fund for Undergraduate Support

A new endowment established by Lynne and Richard Croft will provide direct financial support for undergraduates in HCDE.

The fund is established to honor Richard's late father, William "Bill" Croft, and it is to support students who are interested in the user-centered design of products, processes or procedures relating to flight controls and/or aviation and aeronautical safety. "My father was one of the pioneers in the field of human-centered design — before it was known by that name — as it related to aircraft cockpit design," Mr. Croft described. "Dad started out as an engineer more concerned with the operation and performance of individual radios and navigation aids, and ended up working to make sure that the entire flight deck was the best environment for pilots to do their job. He spent many hours describing to us the research being done on how the height of the seat affected pilot performance, or the fabric covering the seat, or the number of people that were in the cockpit at any time, not to mention the placement of the controls and displays." Mr. Croft recalls his father purchasing the first flying lessons for half a dozen of his young friends and family members to help them grow an interest in aviation. "He liked to help people. We think he would want us to help students who had similar interests," Mr. Croft said.

Michael and Sirina Berg Endowed Fund for Leadership in Human Centered Design & Engineering

A new endowment established by Sirina and Michael Berg (MS '09) will offset tuition expenses for HCDE undergraduate and graduate students based on academic merit and financial need, with a preference given to those students who demonstrate an interest and/or active role in advancing the research and career interests of women in HCDE. Mr. Berg, affiliate faculty member in HCDE and a Senior UX Researcher at Amazon, has long been a dedicated supporter of the department. Mr. Berg completed the Certificate in User-Centered Design in 2005 and the Master of Science in 2009. Since then, he has taught HCDE courses on usability studies, regularly volunteered for mentoring and career events, and led directed research groups where students tackle real-world UX projects.

"I gain so much from every experience I've had working with HCDE students," Berg described. "I'm a complete broken record in saying that I can't believe HCDE lets me have so many experiences. Being a student in the HCDE program changed my life, but the best part of HCDE is that your experience doesn't end. As an alum there is so much opportunity to stay connected with the department and its mission. And being a part of HCDE experiences is less about what you "can do" and more what you 'get to' do."

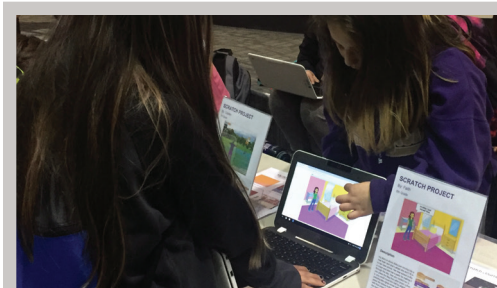
HCDE ALTERNATIVE SPRING BREAK

HCDE students participate in an Alternative Spring Break for the second year

For the second year in a row, HCDE worked with the UW's Pipeline Project to send students on an engineering-focused alternative spring break experience. Both years, the team of HCDE and CSE students visited the Makah Reservation in Neah Bay, Washington, where they led a week-long workshop for middle- and high school students.

In 2018, The workshop focused on digital storytelling and coding using the Scratch programming system. Over the course of the week, the Neah Bay students, guided by the UW team, designed and programmed their interactive stories, and learned the fundamentals of computer programming in the process. The workshop was structured as four daily hands-on sessions, and culminated in a showcase on the fifth day where students shared their digital story projects with the community. The UW students spent the winter quarter before spring break in a Directed Research Group, led by HCDE Senior Lecturer Andrew Davidson and PhD student Elena Agapie, designing their workshop and

tailoring it to the age group and cultural interest of the Neah Bay students.



On the final day of the workshop, students demonstrated the digital storytelling projects they designed using Scratch

The goal of the HCDE Alternative Spring Break collaboration is to help students in remote areas of Washington to see themselves pursuing higher education, and to learn how studying engineering at UW could enable them to live and thrive in their home communities after graduation. The benefit for HCDE students participating is they get to practice teaching concepts they have been learning in the program, and form mentorship relationships with the younger students.

Donations to HCDE enrich the student experience by supporting opportunities like Alternative Spring Break. Learn more at hcde.uw.edu/give.



The 2018 HCDE Alternative Spring Break team in Neah Bay, WA
Standing: Nate Young, Elena Agapie, Melody Xu, Melissa Birchfield, Pooja Ghelani, Jon Cole, Samantha Gil Vargas, Noelle Merclich, Aylee Neff, Bonnie Tran
Kneeling in front: Andrew Davidson, Lynda Nguyen, Jojo Le, Yeh-Eun Lee

HCDE SUPPORTERS

HCDE thanks the following individuals and corporations for their financial support of departmental scholarships and student opportunities in the 2017 calendar year

FRIENDS OF HCDE

Individuals who contributed up to \$499 in 2017

- Brandi N. Arnold (MS '09)
- Joanna Elise Baillet (BS '17)
- Dale P. Callison (MS '98)
- Monica Carstens (MS '03)
- Dr. Deborah M. Woo-Chinn & Darryl G. Chinn (MS '99)
- Caroline Ann Colon (MS '16)
- Kenneth J. Cook
- Ann Marie & Donald Eberhart
- Jean B. & Prof. David K. Farkas
- Kai Fujita
- Eileen Shan-Lin Hsu (BS '82)
- Prof. Julie A. Kientz
- Marie Helwege Kotowski (MS '95)

- Joy Tollman Lashley (MS '92)
- Christine Loucks-Jaret (MS '99)
- Prof. Sean A. Munson
- Daniel Ahlstrom & Roxane S. Neal (MS '05)
- Robert & Carolyn Pendle (MS '92)
- Aileen S. & Glenn J. Pruiksma
- Kent D. Sullivan
- Sharon T. & Prof. Michio Tsutsui
- Robert A. Wlodarczyk (MS '12)
- Kaiyuan Xu (MS '16)
- Liyin Xue (MS '14)
- Jerrold & Cristina Baillet
- James Leslie Humphrey III (MS '11)

Prof. David W. McDonald

Dr. Constance W. Rice

CHAMPIONS OF HCDE

Individuals who contributed more than \$2,000 in 2017

- Sirina & Michael P. Berg (MS '09)
- Devindra and Manisha Chainani
- Jasen A. Peterman (MS '12)
- Jonathan H. Mark & Donna Marie Sakson (BS '82)
- Joseph Tullio & Dr. Carolyn Wei (PhD '07)

INDUSTRY PARTNERS

Companies who supported the Corporate Affiliates Program and/or HCDE faculty research in 2017

- Alaska Airlines
- American Red Cross

- Anthro -Tech, Inc.
- Blink
- The Boeing Company
- Google Inc.
- Intel Corporation
- Microsoft Corporation
- NAVER Design
- nFocus Solutions
- Tableau Software, Inc.
- Teach for America
- VPGame Inc.
- West Monroe Partners
- Workday, Inc.
- Yahoo at Oath

MINDFUL TECHNOLOGY

HCDE team is building a tool to promote mindfulness through interacting with photos from one's past

A project by students and alumni from the Department of Human Centered Design & Engineering discovers novel ways to encourage mindfulness by considering two dimensions of mindfulness not yet incorporated into popular digital tools.

Building on the dissertation of Mania Orand (PhD '17) on designing interactive technology for travelers, the HCDE team developed ColorAway – an innovative tool that promotes mindfulness through interaction with modified travel photos. The team's research paper about the 16 month design activity that led to ColorAway was accepted into the 2018 CHI Conference on Human Factors in Computing Systems. This project originated from the Directed Research Group led by Mania Orand, and was later pursued by HCDE senior Runyuan (Jason) Chen (BS '18), Shin Young (Lucia) Choi (BS '17) and Leena Choi (BS '18), under Orand's guidance.

"People often think mindfulness is only about meditation, but through reviewing literature,

we found that mindfulness is so much more than just meditation," describes paper lead author and HCDE senior Jason Chen. With ColorAway, solo travelers experience two important dimensions of mindfulness: *recollection* and *evaluation*.

Recollection is the ability to remember and recall past internal learnings, which can be stimulated by objects such as photos that are associated with learning.

Evaluation is the ability to reflexively contemplate on past experience and distinguish between beneficial and harmful qualities. This can be stimulated by looking at experiences from a new perspective.

Orand's interview with solo travelers reinforced that they take a lot of photos during their trips. Thus, the team decided to use travel photos as a means to stimulate recollection and evaluation, and designed ColorAway. The first step in using ColorAway is to select three meaningful photos from travel photo

albums. Then, the photos are processed using ambiguity techniques, such as removing colors and content of the photos in a playful way. Then participants in this research interacted with the altered photos. To encourage creativity and minimize bias, the team did not provide any specific instructions to the participants about how to interact with ColorAway and the participants were not told that ColorAway is a tool to promote mindfulness. Finally, the team interviewed the participants to learn about



Shin Young (Lucia) Choi (BS '17), Runyuan (Jason) Chen (BS '18), Leena Choi (BS '18), and Mania Orand (PhD '17) presented this research at the 2018 CHI Conference

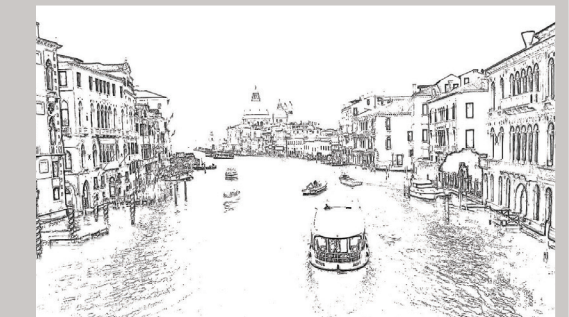
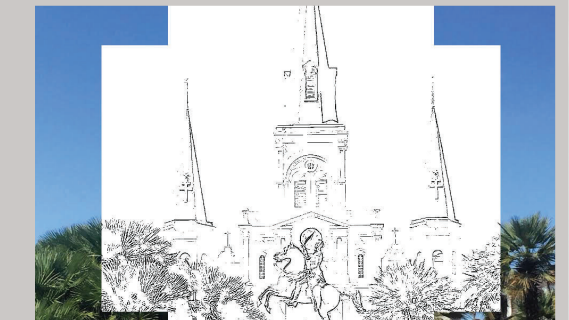
their experience and offer unique insights into how mindfulness can be better designed.

"We all have taken pictures in our trips that we think are really meaningful," Chen describes. "So, for our travelers to see abstracted photos of something they found meaningful, it sparks thoughts. They think 'why did I take this picture?', 'what was I thinking when I took this?' and 'why was this meaningful to me?' That is the evaluation component of mindfulness that we are looking for."

The team cautions people to be careful not to confuse mindfulness with meditation. Chen, who has earned a dual degree in HCDE and philosophy, explained "based on our literature reviews and study of existing smartphone applications, it can be difficult to learn about and attempt mindfulness if people think, 'oh I have to sit still for this' or 'I have to make time for this, I don't have time'."

The team hopes that through ColorAway, people benefit from different aspects of mindfulness, and start to be more attentive to their daily experiences.

The team plans to continue developing ColorAway. "It's still an early phase of this project, but I would like to see ColorAway as an app, or a physical book that solo travelers carry on their journey."



A prototype of ColorAway, an application designed to enhance mindfulness of solo travelers through interacting with modified photos. The "before" photos on the left are selected by a traveler, prompting them to recollect on the past. The "after" photos on the right use ambiguity techniques which allow the traveler to instinctively evaluate them.

HIGH SCHOOL ROBOT DESIGN SHOWCASE

Area high school students developed robot prototypes for Project EMAR's Social Robot Design Challenge

Teenagers experience high levels of stress in their lives, resulting from school, relationships, and family life. Research has found social robots useful in providing support for people and for gathering information about their environments, however there is little research about how teens and robots interact.

Project EMAR (Ecological Momentary Assessment Robot) is an NSF funded project exploring the use of a social robot to effectively measure and address teen stress. The Project EMAR team is led by Elin Björling, HCDE Research Scientist; Emma Rose (PhD '11), assistant professor at UW Tacoma; and Maya Cakmak, assistant professor in the Paul G. Allen School for Computer Science & Engineering.

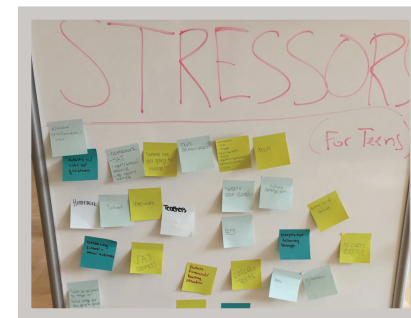
In a winter quarter Directed Research Group, the team launched a high school design challenge to prepare teens with the necessary

tools to design and prototype their own robot concepts. These high school students were asked to design a robot that would live at their school and help to reduce stress. The teens learned the human-centered design process and then spent 4-8 weeks to design their prototypes. The high school teams were coached by UW students and faculty.

In March 2018, the teens visited campus to present their prototypes to a panel of experts at the Social Robot Design Challenge Showcase. Panelists include Maya Cakmak, director of the Human-Centered Robotics Lab; Sean Andrist, researcher at the Microsoft Research Perception and Interaction group; Guy Hoffman, assistant professor of mechanical and aerospace engineering at Cornell; and Sures Kumar, interaction designer at Google's Research & Machine Intelligence team.

The Project EMAR team summarizes the results of the Social Robot Design Showcase:

To say we were blown away by the prototypes that high schoolers brought to the showcase is an understatement. The showcase was a HUGE success as were the teens' creative and inspiring ideas. After spending the past two months exploring the human centered design process, high school students from seven schools made their way to UW Seattle to showcase their final prototypes!

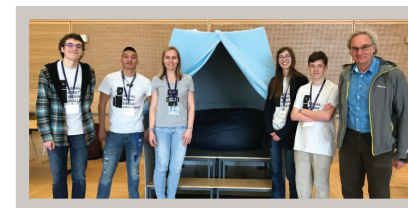


There were two whiteboards so teens could record what causes stress and what relieves stress for them.



BALLARD HIGH SCHOOL

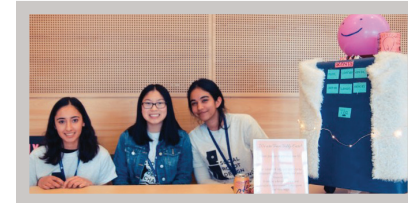
Girls Who Code club members represented Ballard High School at the showcase with their prototype, Lucy. A small, fluffy "dog" on wheels, Lucy is designed to relieve stress by listening. To show that she's listening, Lucy responds by barking, wagging her tail, and moving her ears. Students at Ballard received the "Most Insightful" award for their prototype.



NATHAN HALE HIGH SCHOOL

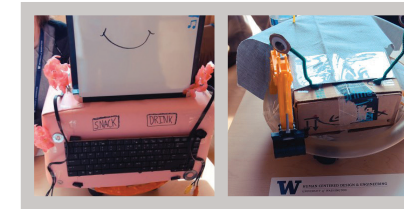
Students from Nathan Hale invited guests into their social robot

relaxation room. The relaxation room features a comfy bean bag chair for stressed teens to lay on while they listen to music to destress. The team recognized that each student has different needs to help them relieve stress, so a voice user interface allows each user to customize their experience. The team from Nathan Hale received the "Most Out of the Box" award for their design.



ROOSEVELT HIGH SCHOOL

The Girls in Tech team from Roosevelt High School showcased Joaquin Bartholomew III: a social robot with a removable fuzzy exterior perfect for hugging. Joaquin Bartholomew III is able to play music and speak to students in different accents, in addition to offering soothing essential oil fragrance options to help stressed teens relax. The Girls in Tech team were awarded the "Most Friendly" from the judges at the showcase for their prototype.



OAKLAND HIGH SCHOOL

Students from Oakland High School showcased two unique robot prototypes at the design challenge: Petunia and ESPAR. Petunia captured the audience's attention with her cute boxy design. Petunia intends to relieve teen stress by supporting students' academic success with her resourceful and helpful demeanor. Petunia was awarded "Most Helpful" by the judges at the showcase. Oakland's ESPAR (Emotional Support Play and Recreation) is a helpful robot who can help students by grabbing, fetching, and carrying items for students. ESPAR aims to reduce teen stress by giving emotional and motivational support to students in need. ESPAR was awarded "Most Robust" by the judges at the showcase.



HENRY FOSS IB WORLD SCHOOL

Students from Foss High School debuted their social robot, Boom Boom, at the showcase. Boom Boom speaks to stressed teens in a voice that sounds like Speedy Gonzales, having therapeutic conversations to help reduce stress. Boom Boom also has the ability to dispense candy and beverages to students to brighten their day. The students from Foss were awarded "Most Versatile" for their prototype.



SCIENCE AND MATH INSTITUTE (SAMI)

Students at SAMI presented CARL Bot: The Comfort and Relaxation Laugh Bot. CARL Bot speaks to users in different tones of voice, quoting Morgan Freeman and a "whacky YouTuber" to help reduce stress. CARL Bot can be found rolling around on caster wheels while playing calming acoustic guitar music when not interacting with teens. CARL Bot was awarded "Most Adaptable" at the showcase.



UW EMAR team coordinated the Social Robot Design Challenge in 2018
Back Row: Alanté Fields, Nicole Alvarez, Christina Nelson, Maya Cakmak, Alex Merk, Wesley Muthemba, Joseph Yoon // Middle Row: Chelsea Galvez, Kartika Rathee, Rachel Ren, Elin Björling, Sara Tieu, Leah Rusienor, Audrey Wu, Emma Rose // Seated: Fadumo Abdirahman, Alisa Kalegina

STUDYING MEANINGFUL SMARTPHONE USE

It's not only which apps you use, but how you use them, HCDE researchers suggest

Today's smartphones offer great benefits to society. Apps to gather information, increase productivity, and interact with loved ones are at our fingertips. At the same time, smartphones can be tools of meaningless consumption and distraction. As a result, many people feel conflicted about how they spend time on their phone, and fall into patterns of behavior that they wish they could change.

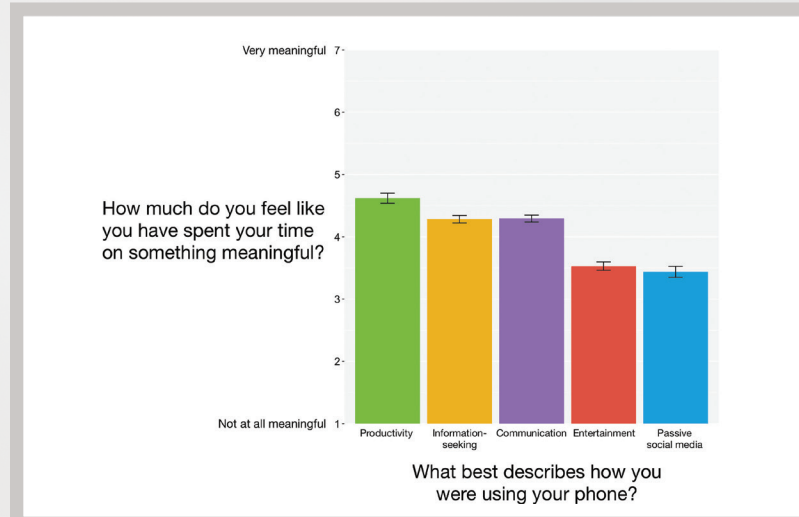
Researchers at the University of Washington and Brown University believe app designers can build more meaningful experiences. "We explored why much smartphone use is seen as engaging, but meaningless in the eyes of users," described Kai Lukoff, a doctoral student in the Department of Human Centered Design & Engineering. "Designers

often optimize their apps for clicks and views, which can lead to experiences where people feel sucked into a black hole. Our goal was to identify the experiences that people find meaningful and help designers build around those instead."

To explore this, the researchers conducted a study of 45 smartphone users over two weeks, logging 86,402 sessions of app use. Immediately after using an app, study participants were sometimes asked what they were using the app for and how meaningful they would rate their experience. The team authored a paper about this study, which was published in the March 2018 Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies.

The researchers found that meaningless smartphone use was associated with the feeling of a loss of control. Habitual smartphone use to pass the time, entertainment consumption, and passive social media intake — that is, browsing social media without interacting with other people — led to a lower sense

of meaningfulness. On the other hand, study participants identified using a smartphone for productivity tasks and to communicate with close friends or family as highly meaningful. In this case, productivity includes actions like managing to-do lists, communicating with others, and tracking fitness goals.



"It's not only which apps you use, but how you use them," described Lukoff, the paper's lead author. "On the one hand, when participants messaged with close family and friends on Facebook, they reported it as a highly meaningful experience. But at the same time, they also reported that browsing the Facebook newsfeed led them to feel a real loss of control over their actions and smartphone use."

For some users, 'meaningless' activities on their phone served as a welcome relief from stressful situations in real life. "When they were frustrated with their boss at work or their kids in the kitchen, some people used their smartphone to cool down their hot emotions," Lukoff said. In these cases, the phone was a useful tool for regulating emotions.

"We want to understand how to give people power in this situation," said co-author Alexis Hiniker (PhD '17), assistant professor in the UW Information

School. "If they are losing the feeling of autonomy over their smartphone and don't feel like they can control their behavior, then we want to demand better from designers. Instead of thinking exclusively about how to help users exert greater self-control, we want to examine the path the designer is trying to lead them down and whether that is likely to lead to a meaningful experience."

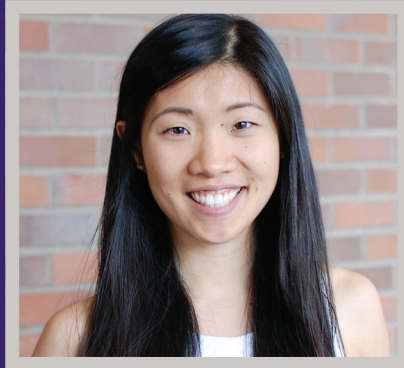
The research team suggests that app designers who want to build meaningful experiences should respect their users' autonomy. One way to do this is to examine how their app supports or distracts a user from their purpose. Lukoff cites Gmail as an app that respects a user's autonomy by encouraging them to move on after their original purpose is achieved. When someone reaches an empty inbox in Gmail, the app shows a blank screen with the message "You're all done! Please enjoy your day."

In future research, Lukoff and colleagues will study the creative strategies that people use to take back control of their smartphone use. Grassroots movements such as the Center for Humane Technology advocate for users to modify the phone's default settings to limit distraction, including turning off notifications and changing the screen to grayscale. The research team will study these and other strategies: "We want to help people architect their smartphone use so that the device works for them, rather than the other way around," said Lukoff.

Co-authors on the paper are Julie Kientz, associate professor of Human Centered Design & Engineering, and Cissy Yu, Brown University.

COLLEGE OF ENGINEERING AWARDS

HCDE Senior Kaitlyn Zhou and Assistant Professor Kate Starbird are recognized by Engineering Dean Bragg



KAITLYN ZHOU
2018 DEAN'S MEDAL

Kaitlyn Zhou, a senior double-majoring in HCDE and Computer Science & Engineering, received the College of Engineering Dean's Medal for Academic Excellence. Zhou has the distinction of being the first HCDE student to receive this honor. The Dean's Medal

is awarded annually to two students in the College of Engineering who demonstrate academic excellence, research and industry experience, campus and community involvement, and leadership.

Since her freshman year, Zhou has been involved with HCDE research, frequently collaborating with Assistant Professor Kate Starbird on investigations into the online spread of misinformation in the wake of disaster events. Zhou is the Founder and Chair of the CSE Student Advisory Council, a group that focuses on efforts such as diversity, social good, and student wellness, and she was the Director of University Affairs for the Associated Students of the UW in 2016–2017, a position that is the primary student representative in faculty and administrative decisions on academics, admissions, and tuition. In 2017, Zhou completed an internship as a software engineer at Bloomberg L.P. in New York City, and in summer 2018 she will be a data science intern at Twitter in San Francisco. She looks forward to returning to UW as a Master's student in the Paul G. Allen School of Computer Science & Engineering.



KATE STARBIRD
2018 JUNIOR FACULTY AWARD

Kate Starbird, Assistant Professor in HCDE, received the 2018 Junior Faculty Award from the College of Engineering. This award recognizes faculty members at the assistant professor rank who exemplify excellence in research

and education; show that research results contribute to the expansion of knowledge or improvement in quality of life; and show evidence of making an impact to improve education.

Starbird directs HCDE's Emerging Capacities of Mass Participation (emCOMP) Laboratory, where she works with students to study the dynamics of massive participation and interaction enabled by new and social media. Her current focus on the spread of disinformation stems from her ongoing research into crisis informatics, or how people use digital tools to communicate in the wake of disaster events. Recent research by Starbird and her students has discovered vulnerabilities in our online systems to disinformation, and at times of disasters and crisis events, quick access to accurate information is critical. Starbird's work aims to help people, and the online platforms they use, be more resistant to disinformation.

FIVE HCDE STUDENTS IN THE HUSKY 100

The Husky 100 recognizes 100 students from across UW's three campuses in all areas of study who are making the most of their time at UW—both inside and outside of the classroom



SAMANTHA GIL VARGAS

Throughout my Husky Experience, I have learned that as a designer I have the power to actively listen to marginalized communities so that I can better design a society fit for all of us.



SHARON HEUNG

I am passionate about the intersection of engineering, design and health. Currently, I am merging my interests by designing and building a transfer device for individuals with disabilities, using technology and design to empower people and encourage inclusion.



MELISSA MEDSKER

From making the switch from pre-med to computer science, to discovering a passion for research and teaching, to finding my voice through various TA and leadership roles, my Husky Experience has been defined by discovery and a growing appreciation of the value of taking risks.



TSEWONE MELAKU

As a Black woman who is a first-generation college student and the daughter of Ethiopian immigrants, the UW has provided me with the experiences and skills I need to realize that I want to use my engineering degree to increase STEM exposure and education in underserved communities.



BURREN PEIL

In HCDE, I have enjoyed working as a lead course assistant and have helped shape the course towards an emphasis on mentoring and inclusivity. My personal research is on using virtual reality technology to facilitate compassion across differing identities as a proactive approach to social equity.

Learn more about these five and all of the HUSKY 100 honorees at uw.edu/husky100.

HCDE FACULTY

CECILIA ARAGON *Professor*

CYNTHIA ATMAN *Professor*

BROCK CRAFT *Senior Lecturer*

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LEAH FINDLATER *Assistant Professor*

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JULIE KIENTZ *Associate Professor*

BETH KOLKO *Professor*

CHARLOTTE LEE *Associate Professor*

DAVID MCDONALD *Professor & Chair*

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MARK ZACHRY *Professor*

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See what types of jobs our graduates have found, and why current students chose HCDE.
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meetup.com/UWHCDE

ANNUAL EVENTS

Please join HCDE for any of the following community events

HCDE SEMINAR SERIES

WEDNESDAYS, AUTUMN QUARTER

HCDE faculty discuss their latest discoveries in a 10-week seminar on current research in the field of human centered design.

hcde.uw.edu/seminar-series

UX SPEAKER SERIES

FRIDAYS, WINTER QUARTER

HCDE welcomes industry experts to speak about current topics in User Experience (UX).

hcde.uw.edu/ux

HCDE OPEN HOUSE

HELD ANNUALLY IN JUNE

The HCDE Open House features student capstone projects, presentations from Directed Research Groups, prizes, food, and fun.

hcde.uw.edu/open-house

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» COLLABORATE

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