

THE FINAL FRONTIER

Looking to the Stars with CosmicAI

Don Norman Visits the U
Theater and Technology
Collide in Tokyo

Credit: Bettymaya Foott, NRAO/AUI/NSF



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THE UNIVERSITY OF UTAH



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This issue recognizes the achievements of our outstanding faculty and students. The cover story features Utah's involvement in the CosmicAI Institute, an accelerant to research in AI applied to astronomy and cosmic origins. We also highlight three associate professors who were recognized with the very prestigious Presidential Early Career Award for Science and Engineering, given to fewer than 400 researchers nationwide.

Over the past year, we have focused on broadening our impact and reach: encouraging students to pursue high-impact work, inviting distinguished speakers to share their insights, and engaging with the community. In this issue, we present two incoming PhD student recipients of the Kahlert PhD Fellowship, and two continuing graduate student recipients of the inaugural Kahlert Impact Award. Additionally, graduate student applications increased by 68%, and the graduate student offer acceptance rate rose by 10%: a testament to the growing reputation and appeal of our programs. We also recruited five outstanding new faculty members who bring fresh energy and expertise to our academic community.

Looking to the future, we are enthusiastic about the achievements to come. One of the most exciting milestones on the horizon is the continued progress of construction on our new home: the John and Marcia Price Computing and Engineering Building. This state-of-the-art facility, opening in 2027, will serve as a hub for innovation, collaboration, and community engagement. We look forward to welcoming students, alumni, and partners into this transformative space.



The achievements of the past, and those we hope to attain in the future, are made possible by the dedication of our students, faculty, staff, alumni, and supporters. We are especially grateful to the Kahlert Foundation and all of our generous partners for their continued investment in our vision and future. Together, we will continue to blaze a trail in computing and make a lasting impact for generations to come. As we look ahead to the Fall 2025 semester, the mission of the Kahlert School of Computing remains clear: to attract, mentor, and equip new generations of computing researchers, software developers, and entrepreneurs.

Mary Hall

Mary Hall

Director, Kahlert School of Computing



Left: Progress continues on the John and Marcia Price Computing and Engineering building, opening in 2027.

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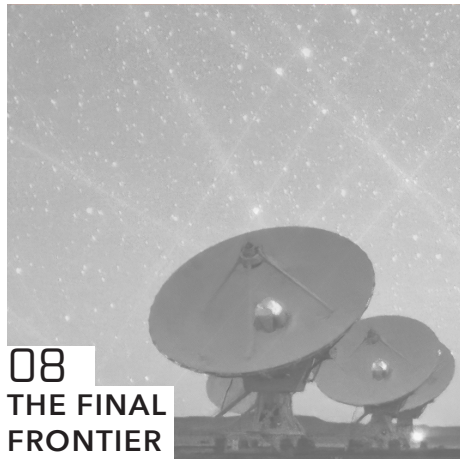
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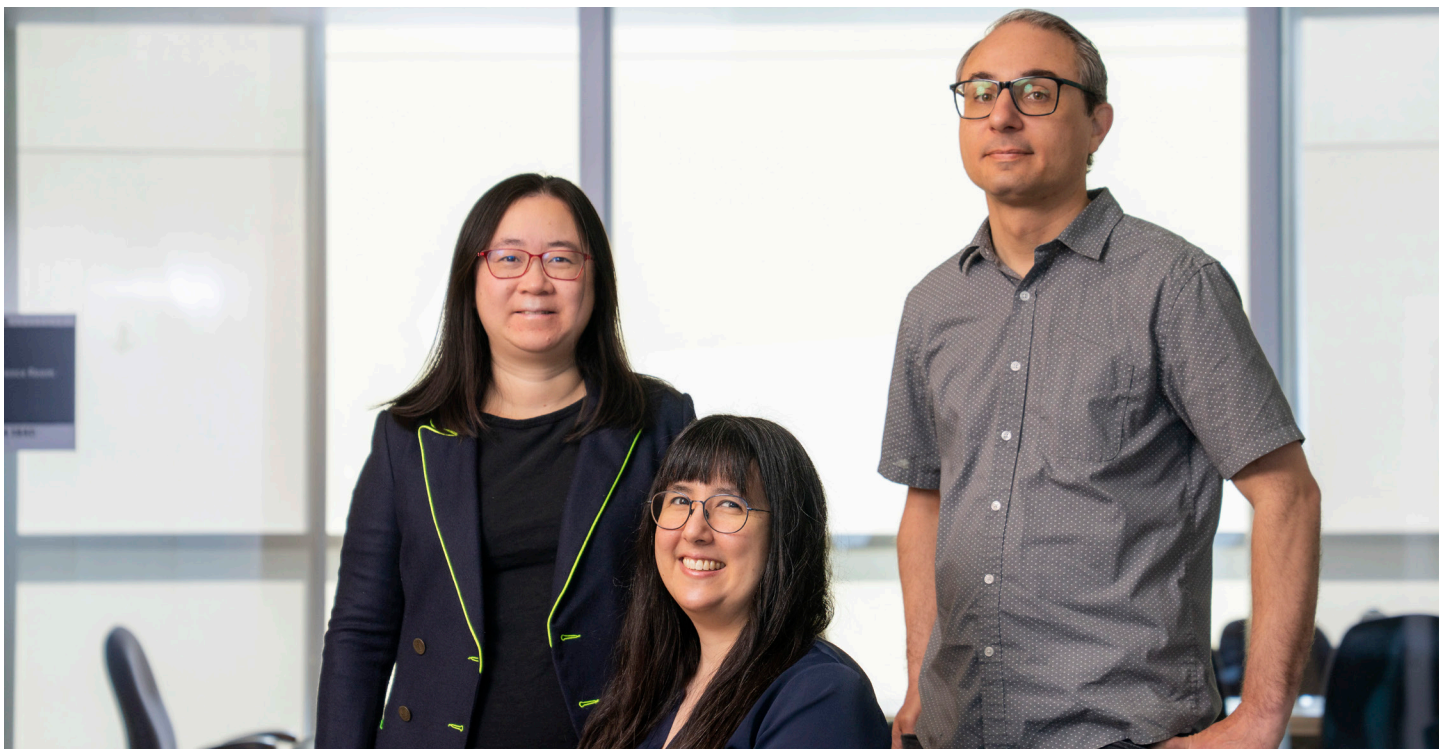
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PECASE

Three Kahlert School of Computing Researchers Among Nearly 400 Researchers Nationwide Bestowed U.S. Government's Highest Honor for Early Career Scientists and Engineering Researchers

On January 14, 2025, the White House's Office of Science and Technology Policy announced the recipients of the 2024 Presidential Early Career Award for Scientists and Engineers (PECASE). Three Kahlert School of Computing researchers are among them: Kate Isaacs, Ryan Stutsman, and Bei Wang Phillips.

Established in 1996, the award honors outstanding scientists and engineers who are at the start of their independent research careers, marking their potential to become leaders in their fields. It is the highest honor bestowed by the U.S. government for early-career scientists and engineers.



From left to right: Associate Professor Bei Wang Phillips, Associate Professor Kate Isaacs, Associate Professor Ryan Stutsman. Photo courtesy of Dave Titensor.

Awardees are first nominated by one of the federal agencies that fund the majority of the nation's scientific research.

Stutsman, an associate professor in the Kahlert School of Computing, was nominated by the National Science Foundation. Stutsman researches data center storage systems and networking.

Isaacs and Wang Phillips, both associate professors in the Kahlert School of Computing, were nominated by the Department of Energy. Both work on ways of visualizing large-scale computer simulations; Isaacs focuses on representing the internal workings of supercomputers, while Wang Phillips visualizes interactions between atmospheric phenomena.

Isaacs is also an associate director of the Scientific Computing Institute, where Wang Phillips and fellow University of Utah PECASE honoree Amir Arzani have appointments.

Modified from an article by Evan Lerner originally published on the Price College of Engineering website.

AI GOES THEATRICAL

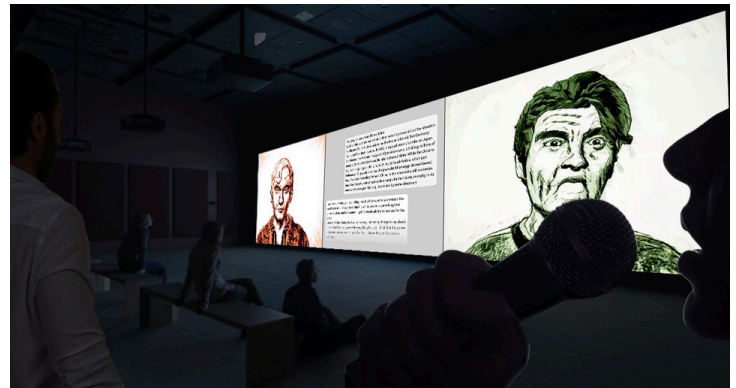
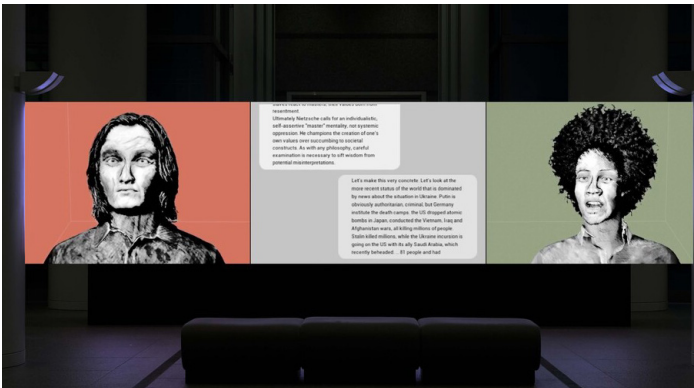
Tokyo's Mori Art Museum Features an AI Art Installment Utilizing Work from Kahlert School of Computing Faculty

In the bustling Roppongi district in Tokyo's Minato ward lives the Mori Art Museum, a contemporary art space nestled in the 54-story Roppongi Hills Mori Tower.

A recent exhibit at Mori Art Museum entitled “MACHINE LOVE: Video Game, AI and Contemporary Art” contained approximately 50 works of contemporary art utilizing game engines, AI, and virtual reality (VR). Among the works exhibited was German American artist Diemut Strebe's “El Turco/ Living Theater” featuring code written by Kahlert School of Computing Assistant Professor Ben Greenman.

The piece presents two character puppets on screen. The puppets speak out loud as their lips move in sync, and their words appear on screen like a chat history. One puppet portrays an inventor of smart home devices being interviewed by the other puppet. However, the course of the conversation can change, and each performance is unique.

One puppet is controlled by a human. Another puppet is controlled by Anthropic's Claude AI. The audience is faced with a challenge: which puppet is AI, the inventor or the interviewer? Does it matter?



Photos of “El Turco/Living Theater” courtesy of elturco.diemutstrebe.com

Behind the scenes, this project combines several technologies: including Claude API, Azure text to speech, Amazon speech to text, and Unreal Audio to Face. The piece uses the Racket programming language, developed by Kahlert School Professor Matthew Flatt, to synchronize these different technologies in an event-based framework. For example, Audio to Face can sleep until Claude has written the next part of its puppet's script.

Select performances of “El Turco/Living Theater” are available on the artist's YouTube channel, youtube.com/@diemutstrebe2252.

Greenman would like to extend a special thanks to Varun Shankar for providing machine access for software development.

KAHLERT IMPACT PRIZE

We are proud to recognize the inaugural recipients of the **Kahlert Impact Prize**.

The Kahlert School of Computing offers the Kahlert Impact Prize to two graduate students who, whether through research or service, show a track record of success and a compelling story of the high impact of their work. Honorees receive a scholarship of \$2,000 each.



Amit Samanta
PhD Student

Amit works in the area of system design and implementation. His recent work has focused on serverless computing platforms, which are often deployed by large cloud services. Cloud workloads demand massive resources, and they are often dynamic and unpredictable. Amit's contributions improve resource utilization while targeting performance and sustainability metrics.

Amit has published many papers at top systems conferences, earning him multiple awards. He has collaborated with industry professionals on some of his work. A key novelty is the deployment of scheduling algorithms that consider cutting-edge technologies like persistent or disaggregated memory. More recently, the carbon footprint of cloud platforms has come under scrutiny—Amit's ongoing work explores carbon-aware and sustainability-aware network routing schemes. Amit has a long track record of service to his research community, including engagement in program committees, artifact evaluation committees, and event organizing.



Maitrey Mehta
PhD Candidate

Maitrey works to expand the impact of AI to low-resourced languages. While most recent large language model advancements (like ChatGPT) are evident for English, progress in other languages has languished. Maitrey has focused on his native language of Gujarati, with hopes that it provides a roadmap to extend AI technologies to the many other languages spoken by the world's population.

Maitrey's vision is to give every human the right to interact with technology in one's native language. To achieve this, he focuses on a key ingredient for developing this technology: data. Data is the fuel that powers modern LLMs, and there is an unfortunate data disparity across languages. His research aims to find efficient methods to close this resource gap. Maitrey contributed the first semantically annotated dataset in the Gujarati language that also captures cultural nuances. Subsequently, this dataset has been used to create dependency treebanks and other basic language tools like parsers and taggers. Maitrey has collaborated with industry and other groups on campus. He has helped the research community by serving on program committees and through mentorship roles. Among many talks on AI, he has also presented to an audience of veteran business owners at the 7th Annual Utah Veteran Business Conference in 2023.

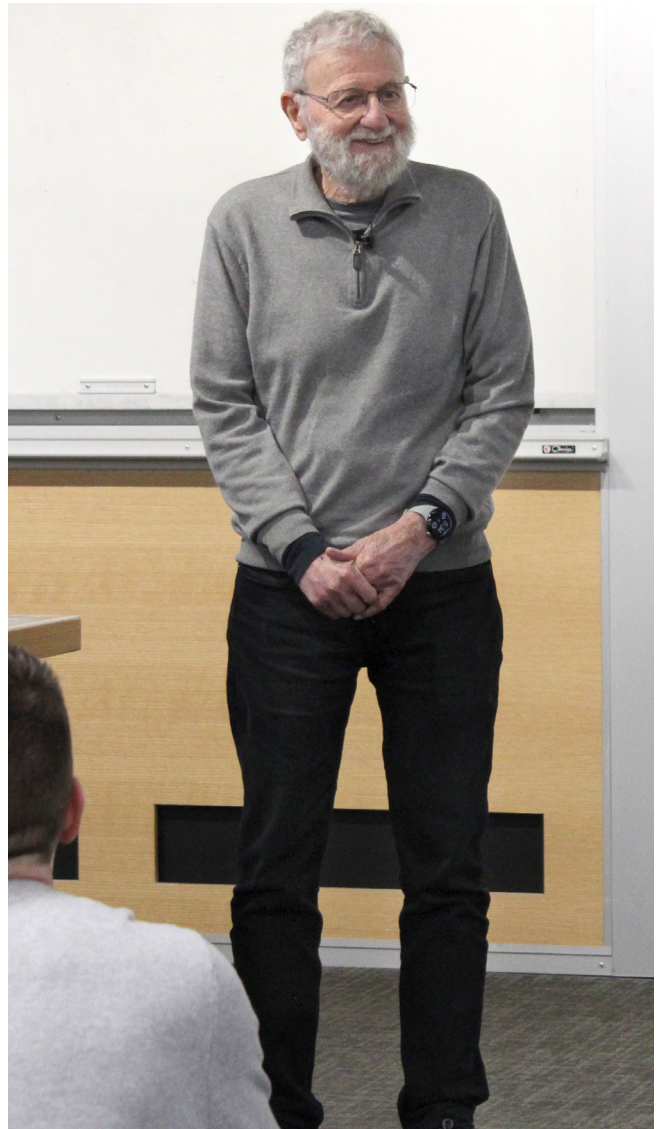
DISTINGUISHED DISCUSSION SERIES

with Don Norman

In Spring 2025, the auditorium in the Rio Tinto Kennecott Mechanical Engineering Building was standing room only for a Q&A session with Don Norman.

The former Vice President of Apple's Advanced Technology Group, Norman currently serves as director of The Design Lab at University of California, San Diego. His books on design, particularly *The Design of Everyday Things*, are bestsellers that are influential across a myriad of professions.

Students and attendees submitted their questions to Norman in real-time using a QR code, and could rate the questions that they most wanted answered. Topics discussed during his visit covered the expanse of his career and his expertise in topics such as usability engineering, as well as whether or not he had survived a plane crash, a story often wrongfully attributed to him.



THE FINAL FRONTIER

Looking to the Stars with CosmicAI

Prior to his passing, beloved astronomer Carl Sagan spoke at a conference, where the topic of continued cosmic research came up.

“The job is by no means done,” he said. “We will look for the boundary between the solar system and the interstellar medium and then we'll voyage on forever in the dark between the stars.”

In the present day, cosmic research continues through the help of computer scientists.

In the fall of 2024, the National Science Foundation and the Simons Foundation partnered to launch the Artificial Intelligence Institute for Cosmic Origins, also known as CosmicAI.

“CosmicAI develops transformative AI methods to meet pressing astronomical challenges and tackle outstanding questions about our cosmic origins. Research spans four fundamental AI themes: trustworthiness, efficiency, interpretability, and robustness,” states their webpage. “CosmicAI aims to serve as a nexus of collaboration to increase the accessibility of astronomy and AI data and methods through open-source AI-powered tools, data sharing, and AI educational initiatives.”

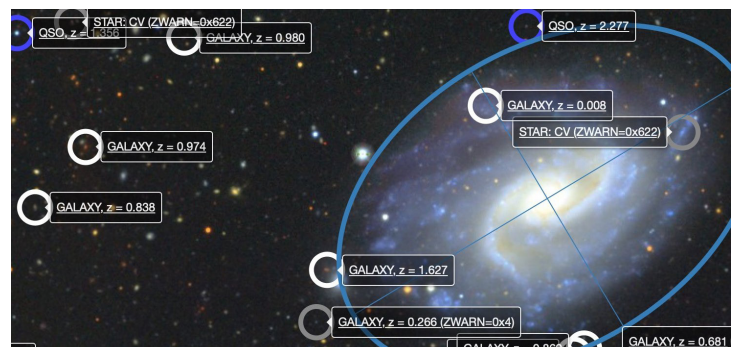
Kahlert School of Computing faculty members Jeff Phillips, El Kindi Rezig, and Ziad Al-Halah are among the researchers involved in CosmicAI. Researchers come from the University of Utah, University of Texas at Austin, University of Virginia, National Radio Astronomy Observatory, National Optical and Infrared Research Laboratory, and University of California Los Angeles.

In addition to contributions from Kahlert School faculty to AI research, expert researchers across disciplines develop new technologies in the intersection between artificial intelligence and astronomy.

Most recently, CosmicAI hosted their 2025 Cosmic Horizons Conference, the first iteration of what will become an annual event. More than 40 presentations from astronomers and AI researchers across 40 institutions presented their work.

The 2025 Cosmic Horizons Conference included a panel supporting next-generation researchers, featuring University of Utah Physics and Astronomy assistant professor Tanmoy Laskar as a panelist. Topics explored included career building strategies, networking, and opportunity development.

CosmicAI will receive \$20 million in funding over its five year mission, continuing Sagan's voyage on forever in the dark between the stars.



Left: CosmicAI hosts a panel at the inaugural Cosmic Horizons Conference. **Right:** CosmicAI's Explorable Universe group maps and models the skies. Images courtesy of cosmicai.org

2025 DATA SCIENCE & AI DAY

229 students, faculty members, University staff members, and attendees from the general public gathered in the A. Ray Olpin Student Union ballroom on Friday, January 24, 2025, for The Utah Center for Data Science's annual Data Science & AI day.

The event began with ten research poster presentations from current students sharing their knowledge with peers and professors alike. Simultaneously, partners with University Career Success hosted a Data Science & AI Career Fair, connecting students with professionals across the Silicon Slopes as they prepare to enter the workforce.



Keynote Speaker: Professor Dieter Fox of NVIDIA & U Washington

The public has witnessed huge advances in generative artificial intelligence, including large language models, chatbots, and image and video generation tools. How has this progress impacted robotics?

With this question, Dieter Fox, Senior Director of Robotics Research at NVIDIA and University of Washington Professor, captivated the attendees during his keynote. Fox identified large scale data as a primary ingredient to recent advances in generative AI. He then proposed several directions for generating data for robot learning, focusing on his work in using large scale, parallelized simulation as the primary tool to enable massive data generation. He also discussed how this could be combined with human demonstrations. His keynote concluded by demonstrating exciting recent advances achieved using these techniques and gave his thoughts on how neural network architectures should evolve to further their use in robotics.



The afternoon session culminated with research highlights from across the University who have practically applied data science & AI within their work. Assistant Professor Ziad Al-Halah's (Kahlert School of Computing) section "AI in Computer Vision" regarded spatial features in the audio-visual medium. Associate Professor Xiaoyue Cathy Liu's (Civil & Environmental Engineering) section "DS of Human Mobility" discussed AI applications for traffic patterns and safety. Research Assistant Professor Shiqi Yu (Physics and Astronomy) closed out the day's presentations with her "ML for Astronomy" section.

Modified from an article by Ellen Lewis and Tucker Hermans originally published on the Kahlert School of Computing website.

FACULTY NEWS



Director **Mary Hall** is the newly-elected **Vice Chair** of the **Computing Research Association Board of Directors**.

Associate Professor Professor **Tucker Hermans** is among the research team written up in the **MIT News** article “New system enables robots to solve manipulation problems in seconds.”



Professor **Manish Parashar** received the **ACM Distinguished Service Award** for service and leadership in furthering the transformative impact of computer and computational science on science and engineering.

Professor **Blair D. Sullivan** received a **Fulbright U.S. Scholar Program** award in Computer Science to work in France for the 2025—26 academic year from the U.S. Department of State and the Fulbright Foreign Scholarship Board.



ALUM NEWS

Jeff Grover (B.S. '91) chronicles his experiences as a programmer “using a mixture of open-source and commercial tools, combined with the agile developer practices of eXtreme Programming.” Discover more at pairingwithbots.org.

Jeremy Heintz (B.S. '11) is a Lead Lightspeed Engineer at **Pixar Animation Studios**. He has worked on films including *Luca*, *Lightyear*, *Elemental*, *Inside Out 2*, and the latest Pixar film *Elio*. Heintz is currently working on *Toy Story 5*.



Eli Friedman accepted the Shane and Robin Robison Endowed Fellowship from the John & Marcia Price College of Engineering.

Eli is an incoming PhD student in theoretical computer science, with strong interest in combinatorial graph algorithms. He graduated from Dartmouth College in 2025 with a bachelor's in computer science and a minor in classical studies, and he wrote an undergraduate thesis on the Directed Steiner Forest problem in planar graphs. Eli hopes to bring modern algorithmic techniques to classic theory problems and continue closing the gap between hardness and achievability on graph problems.

Outside of research, Eli can be found skiing, cooking, or eating.



Shamit Fatin is the recipient of the Kahlert Fellowship Award. Shamit is a Computer Science and Engineering graduate from Bangladesh University of Engineering and Technology.

The elegance and rigor of mathematical proofs have always fascinated him, while the experimental and creative nature of research drives him towards the process of building, testing and discovering new insights. He strives to bridge theoretical concepts with real-world applications. He enjoys building practical, efficient, and genuinely beneficial systems and wishes to make his innovations available to all.

Outside the lab, music and art are the sources of Shamit's creative energy. Playing the guitar or sketching helps him view problems from new perspectives. He is also an outdoor enthusiast and looks forward to exploring Utah's hiking trails throughout his PhD journey.

CALLING ALL ALUMS: WE WANT TO HEAR FROM YOU!

What professional achievements have you accomplished since graduation? Email ellen.marie.lewis@utah.edu with the email subject "Alumni News" and your first and last name.

Your achievements could be featured in an Alumni News page in an upcoming issue of COMPUTE, reaching a network of thousands of Kahlert School of Computing graduates.



STUDENT SPOTLIGHT

Q&A with Stefan Mada, Honor Student, BS in Computer Science with a Minor in Mathematics

What program are you in, and what year will you finish?

I am currently a fourth year honors student majoring in computer science with a minor in mathematics. I will be wrapping up my degree this spring!

Where are you from?

I was born in West Jordan, Utah, and I've grown up here my whole life. I have lots of fond experiences in the mountains and in southern Utah.

How did you become interested in computer science?

I became interested in computer science during 5th grade, while I was playing some games on my computer and learned that you could actually make your own! I was never very good at making games, but I enjoyed the process of learning about programming. I took up some personal projects in high school to learn OpenGL and play with C++, which solidified my desire to pursue computer science in college.

What interested you in pursuing this degree at the U?

The University of Utah has a highly ranked CS program with a lot of strong research in computer systems, which I was particularly interested in when I applied. It was also close to the mountains I loved, so I was excited to attend at the U.

How will you use your degree in the future?

I hope to use my degree in the future to work as a compiler engineer or software engineer! To this end, I hope to get a graduate degree in computer science to have a more detailed understanding of computer systems.



What is your favorite class in the program?

I would definitely have to say CS 6475 - Advanced Compilers. This was taught by Dr. John Regehr, who I have had the honor of doing research with, and it was an extremely interesting class. We got to make our own compiler for an esoteric language, and I found it very instructive. The best part about it to me was that I was very interested in the subject material, the professor was very excited and knowledgeable about the subject, what we learned about was largely determined by the class, and we learned about many interesting things not covered in the standard compilers class, such as dealing with vector instructions. Overall, I wish I could take a followup course!



Is there a specific mentor, club, or program that made a difference in your experience here at the Kahlert School of Computing?

Dr. Regehr made a big difference in my experience here. As a freshman, I asked him if he had any room in his research group for me, and he graciously said yes. Since then, he has been my research mentor for my entire undergraduate career, and has been invaluable in helping me further my understanding of compilers and computer systems. I credit a lot of my success in other classes and jobs to the work I've done with him.



STUDENT SPOTLIGHT

Q&A with Mahnoor Saad, Computer Vision Group PhD student

What program are you in, and what year will you finish?

I just completed my second year as PhD student in the Computer Vision lab. I'm hoping to complete my PhD in the recommended timeframe of five years.

Where are you from?

I am from Pakistan. A small but beautiful country in South Asia that I think everyone should visit once in their lives (at least)!

How did you become interested in computer science?

I've been drawn to STEM subjects from a young age, but it was during my teenage years while exploring different academic and career paths, that I found myself consistently gravitating toward computer science. What excites me most about the field is how it challenges me to think critically and creatively. Solving problems in computer science often feels like working through intricate puzzles, and I enjoy the mental workout it provides. It's both intellectually rewarding and genuinely fun.

What interested you in pursuing this degree at the U?

Right after completing my bachelor's degree, I worked as a machine learning engineer at a startup, where I was essentially doing the kind of work I now do in my PhD. I spent a lot of time reading research papers and implementing those ideas across different domains—something that quickly became my favorite part of the job. I applied for a PhD somewhat impulsively, simply because I was enjoying the work so much. Fortunately, everything fell into place, and now I'm here, doing what I love and genuinely enjoying the journey every day.

What is your favorite class in the program?

I really enjoyed taking CS 6320 (Computer Vision) taught by Professor Ziad Al-Halah. I thoroughly enjoyed learning the foundational concepts behind computer vision. In an era where deep learning dominates the field, it was refreshing to take a step back and understand the core mathematical principles and classic techniques that laid the groundwork for modern algorithms.

I also enjoyed CS 6300 (Artificial Intelligence) taught by Professor Tucker Hermans. Although my primary focus has been machine learning, this course allowed me to explore areas like embodied agents and reinforcement learning in depth. It was a valuable opportunity to broaden my understanding and appreciate how these systems work under the hood.

Is there a specific mentor, club or program that made a difference in your experience here at the Kahlert School of Computing?

Absolutely! My advisor, Dr. Ziad Al-Halah, has been an invaluable mentor throughout my journey. I began my PhD with little research experience, and he has played a key role in shaping me into an independent and creative researcher. His guidance, patience, and encouragement have made a lasting impact on my academic growth.

Pursuing a PhD can be a long—and at times isolating—journey. That's why I believe it's essential to have mentors, communities, or even just a strong support system to help navigate the highs and lows. For me, that constant source of support has been my husband, who is also a PhD student in the Kahlert School of Computing. He's my anchor, someone I turn to whether I'm overwhelmed, discouraged, or celebrating a small win. I truly don't think I would've made it this far without his unwavering encouragement and support.



How will you use your degree in the future?

I've always envisioned myself working in industry, applying my research to real-world products that are integrated into larger systems and used by everyday people. However, during my undergrad back home, I was the only woman in a class of 50 male students. That experience left a lasting impression and a desire to help change the narrative. Because of that, I now feel a growing pull toward academia. I would love to contribute to creating a more welcoming and supportive environment for everyone in computer science—one that brings together creative minds from all backgrounds to drive the next wave of groundbreaking innovation.

COMPUTE

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