



UNIVERSITY  
OF WYOMING

# **EMPOWERING WYOMING'S FUTURE**

## The University of Wyoming AI Initiative

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A Summary Prepared Following the October 18, 2024  
AI Breakfast with Industry Partners



# A MESSAGE FROM THE PRESIDENT AND VICE PRESIDENT

Thank you for joining us for a conversation following the Wyoming Global Technology Summit to discuss the University of Wyoming's AI initiative, a pivotal effort to advance our state's prosperity and harness the transformative potential of artificial intelligence in every sector important for the state. At the University of Wyoming, we are committed to driving innovation that addresses the unique needs of Wyoming and creates pathways for national and global impact. As Wyoming's only university, we have a responsibility and a unique opportunity to shape the future, preparing a skilled workforce and fostering research that brings tangible benefits to our communities, industries, and economy.

This initiative spans a spectrum of fields critical to Wyoming's economy, from agriculture and energy to wildlife conservation and healthcare. It reflects our commitment to an inclusive, collaborative approach, engaging with industry leaders, communities, and individuals across the state to ensure AI serves the people of Wyoming.

In the following pages, you will find more about this initiative, our university, and ways we can work together. We invite you to consider how your expertise, investment, and vision could help bring Wyoming-centered, people-powered AI to life.

Best wishes,

Ed Seidel, President

Parag Chitnis, Vice President for Research & Economic Development



*Ed Seidel*



*Parag Chitnis*



# ABOUT THE UNIVERSITY OF WYOMING

As Wyoming's university, the University of Wyoming prides itself in unlocking the extraordinary in every person through education, research, innovation, engagement, and service. A land grant university, UW is a unifying force expanding intellectual opportunity, advancing economic and cultural vitality, and contributing to the well-being of the communities that call Wyoming home. UW is an intellectual powerhouse that fosters transdisciplinary collaboration to address the most complex challenges facing Wyoming.

Working with the University of Wyoming opens doors to opportunities to innovate, develop and collaborate. From interacting with students to partnering with faculty and engaging with programming meaningful to your organization, there are countless ways to connect with UW.

We value your partnership and the opportunity to connect you with the programs at the University of Wyoming that help meet your organization's goals.

The University of Wyoming is proud to offer students a one-of-a-kind education in the heart of the Mountain West. Our beautiful campus is home to nearly 12,000 students each year, many from all parts of the country and from around the world. Featuring over 200 areas of study, the University of Wyoming offers personalized experiences and meaningful interactions with faculty for our students.

The University of Wyoming offers a wide range of both undergraduate and graduate degrees and majors through seven colleges and multiple interdisciplinary programs and departments. With a small student/faculty ratio of 14:1, UW is a community of scholars and learners committed to excellence.

- College of Agriculture, Life Sciences and Natural Resources
- College of Arts and Sciences
- College of Business
- College of Education
- College of Engineering and Physical Sciences
- College of Health Sciences
- College of Law
- Haub School of Environment and Natural Resources
- Honors College
- School of Computing
- School of Energy Resources
- Distance Education
- Graduate Education
- Exploratory Studies

# A WYOMING-CENTERED, PEOPLE-POWERED AI INITIATIVE

The University of Wyoming's AI Initiative is a bold, people-centered effort to shape the future of our state and beyond, empowering citizens and communities to thrive in an AI-driven world. By addressing key industries like agriculture, engineering, energy, tourism, wildlife conservation, and rural healthcare, UW is ensuring that AI enriches lives and drives sustainable growth. As Wyoming's university, UW is uniquely positioned to lead the way in inspiring and educating both AI innovators and users, building a resilient workforce rooted in our values and traditions. This initiative will protect people, uplift businesses, attract investment and equip every student and community to lead in the global AI transformation, securing a prosperous future for all of Wyoming.

In 2024's legislative session, Wyoming's Governor included UW's initiative in his budget request to the legislature. Providing \$2.5M to the University of Wyoming in matching funds, to leverage private support with the aim to build AI expertise at UW. These funds can help to support industry projects, support graduate student work in AI and general programmatic support for the initiative.

## FEATURED COMPONENTS THAT CONTRIBUTE TO AI AT UW

- **School of Computing:** Launched in 2022, the School of Computing aims to provide University of Wyoming students, faculty and staff, and Wyoming businesses and citizens with the computational tools, skills and approaches to drive transformation and innovation in the state. The School of Computing champions broader efforts to make the University of Wyoming more digital, inclusive, interdisciplinary, and entrepreneurial through computing partnerships across Wyoming. Led by Director, Gabrielle Allen, the vision of this new school is to create a unique and inspirational School of Computing with national impact and global reach, providing Wyoming and the world with agile and ethical computing professionals, empowered to address societal challenges that are inherently interdisciplinary.

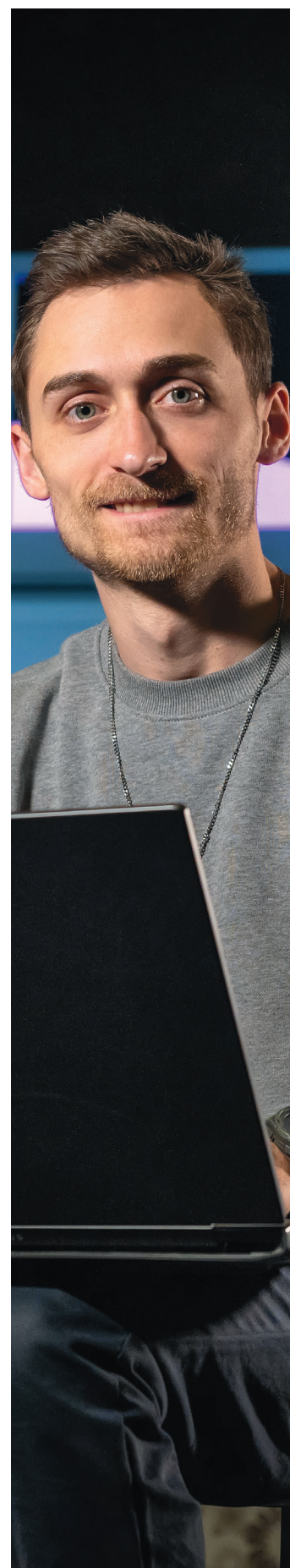




- Masters in AI:** A collaboration of the School of Computing and the Department of Electrical Engineering and Computer Science, this program aims to advance study and research in the field of AI including Explainable AI. It is designed to equip students with the necessary knowledge, skills, and expertise to understand, develop, and apply AI technologies in various disciplines. The program begins with foundational courses covering essential AI topics, such as machine learning, computer vision, and data mining. Students can choose from various elective courses based on their interests and career goals. These courses may include specialized topics like deep learning, natural language processing, reinforcement learning, neural networks, robotics, AI ethics, AI in healthcare, AI for business, and intelligent agents. There are two plans which offer different tracks for students. Electives allow students to deepen their knowledge in specific areas of AI that align with their research or professional interests. Throughout the second track (Plan B), students are involved in research projects supervised by faculty members or industry experts. These projects provide hands-on experience designing and implementing AI systems, conducting experiments, analyzing data, and addressing real-world AI challenges.
- Masters in Quantum Information Sciences and Engineering (QISE):** The MS in QISE is a critical component of the EECS department's goal of developing a research program that is nationally and internationally competitive and relevant to Wyoming by focusing on a few specific areas that have significant anticipated funding growth and economically disruptive technologies. Those areas are (a) modern power grid data analysis and modeling, (b) Quantum machine learning, (c) Quantum security and Internet, and (d) Quantum financing.

The MS in QISE is also central to the aims of the School of Computing and Physics department to provide University of Wyoming students, faculty and staff, and Wyoming businesses and citizens with the quantum computational tools, skills, and approaches to drive transformation and innovation in the state.

- NCAR-Wyoming Supercomputing Center (NWSC):** Opening its doors in 2012, the NWSC represents a collaboration between the National Center for Atmospheric Research (NCAR) and the University of Wyoming. Through the Wyoming-NCAR Alliance (WNA), 320 million core hours of the Derecho System are available for Wyoming-led projects in the atmospheric, earth system, geological, any



NSF support sciences and science areas of interest to Wyoming. The NWSC is the result of a partnership between the University Corporation for Atmospheric Research, the State of Wyoming, the University of Wyoming, Cheyenne LEADS, the Wyoming Business Council and Black Hills Energy. It is operated by NCAR under the sponsorship of the National Science Foundation. Located in Cheyenne, WY – just 45 miles east of the University of Wyoming, NWSC has had more than 4,000 users from more than 575 universities and other institutions across the national and overseas using its advanced computing and data storage resources.

- **NSF's Major Research Infrastructure Track 2 Program:** This August, the University of Wyoming announced being the recipient of a nearly \$4 million grant to acquire state-of-the-art computing infrastructure from the National Science Foundation (NSF). The award for proposal titled *Acquisition of Advanced Infrastructure to Accelerate Impact of AI Through Applications and Innovation for Wyoming (AI4WY)* will provide significant resources to enhance computing infrastructure at UW. This support will improve UW's ability to use artificial intelligence (AI) and high-performance computing to solve problems in areas including the environment, energy, agriculture and public health. UW will have access to 75 percent of the new computing system's capacity, with external partners Colorado State University (CSU) receiving a 15 percent allocation and the Rocky Mountain Advanced Computing Consortium -- composed of 33 institutions in the West, including UW -- receiving 10 percent.
- **Advanced Research Computing Center (ARCC):** The primary research computing facility for the University of Wyoming, ARCC provides centralized scientific computing resources, including HPC and research storage, and is a gateway to other research institutions within Wyoming and across the nation.
- **NSF Engines: Colorado-Wyoming Climate Resilience Engine:** Last May, the National Science Foundation (NSF) announced that the Colorado-Wyoming Climate Resilience Engine was one of the inaugural NSF Regional Innovation Engines. Initially receiving up to \$15 million for the next two years, this program aims to advance the region's research and commercialization efforts focused on sensing, monitoring and predictive analytic technologies for climate resiliency spanning methane emissions, soil carbon capture, earth sensing, water scarcity, wildfires and extreme weather. Key technology areas include disaster prevention and mitigation, advanced materials, advanced energy and industrial efficiency technologies, artificial intelligence, data and cybersecurity, robotics and advanced manufacturing.

The first major outcome is the development and commercialization of advanced climate-resilient technologies. These technologies - spanning from environmental monitoring to predictive analytics - aim to empower communities, governments, and industries to effectively navigate and adapt to the multifaceted challenges posed by climate change.

By focusing on innovative solutions in areas like wildfire mitigation, water resource management, sustainable agriculture and adaptation to extreme weather events, the CO-WY Climate Resilience Engine is poised to revolutionize how we understand, predict and mitigate the impacts of climate change.





## AI FOCUSED FACULTY AND PROGRAMS

The following represents areas of expertise for the University of Wyoming as discussed in our meeting, featuring a collection of faculty and program highlights.

### WILDLIFE & CONSERVATION

#### *Faculty*

- **Dr. Matt Kaufmann** joined the Wyoming Cooperative Fish and Wildlife Research Unit in 2006 and is a faculty member of the Department of Zoology and Physiology at the University of Wyoming. His work studies elk, wolves, moose, deer, pronghorn, and bighorn sheep in Wyoming, addressing the influence of habitat condition, predation, human disturbance, and energy development on these species. Matt's research combines work on animal physiology, behavior and demography to better understand population- and landscape-level processes, including a strong focus on ungulate migration. A primary focus of his research program is to provide timely information to agency biologists charged with managing Wyoming's wildlife.
- **Dr. Jerod Merkle** is an associate professor in the Department of Zoology and Physiology at the University of Wyoming. He is also the Knobloch Professor in Migration Ecology and Conservation. His work studies how the movement of animals relates to environmental heterogeneity and change, and how these interactions scale to population and landscape-level ecological processes.
- **Dr. Ben Koger** is an assistant professor in the School of Computing and the Department of Zoology and Physiology at the University of Wyoming. His lab designs and uses AI-driven imaging systems to scalably monitor and understand the natural world in previously impossible ways. Specifically, combining imaging and computer vision techniques to efficiently monitor wildlife and investigate the social and environmental drivers of animal behavior. His current research focus is understanding pacific salmon migration in Alaska and automating pronghorn monitoring across Wyoming in collaboration with Wyoming Game and Fish.
- **Dr. Ellen Aikens** is a wildlife ecologist in the Haub School of Environment and Natural Resources and the Department of Zoology and Physiology. Her research is rooted in applied data science, using big data techniques to address critical conservation and management issues.

## Programs

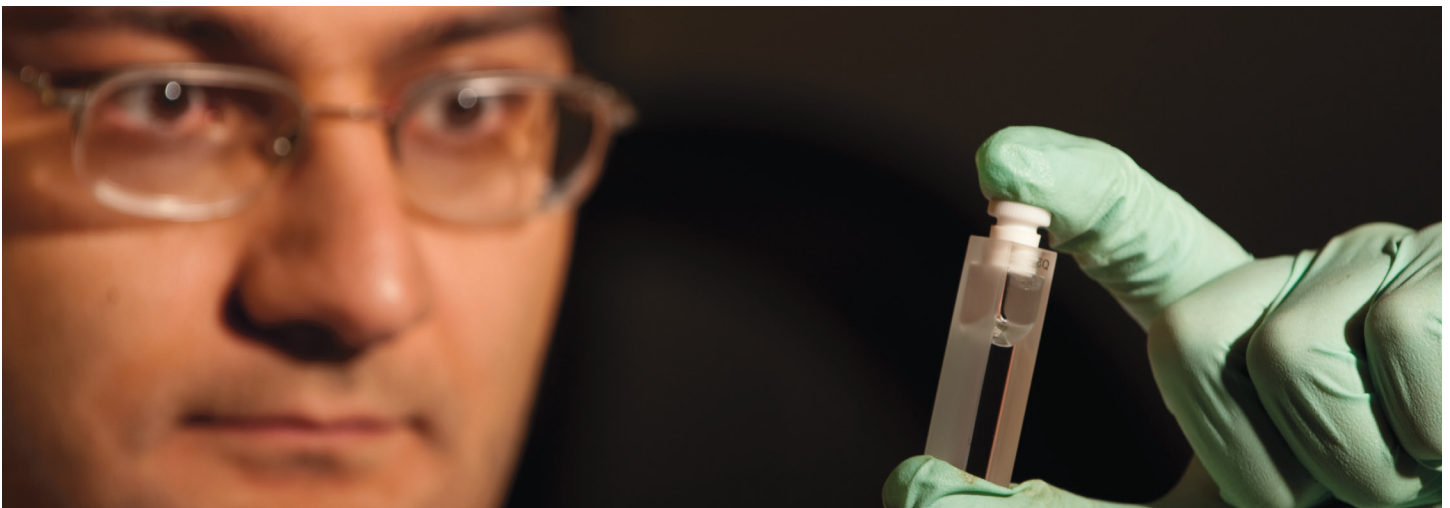
- **Wyoming Migration Initiative's** mission is to advance the understanding, appreciation, and conservation of Wyoming's migratory ungulates by conducting innovative research and sharing scientific information through public outreach. Created in 2012, the Wyoming Migration Initiative addresses threats facing migration corridors to improve understanding of migration ecology.
- **WyldTech:** Center for Wildlife, Technology and Computing 's vision is to leverage new technologies, big data, and computational advances to understand and conserve Wyoming's wildlife on working and changing landscapes.

To achieve our vision, we build inclusive spaces supporting productive interdisciplinary collaborations that advance the frontiers of knowledge, provide management guidance for human wildlife coexistence, and yield products useful to the state of Wyoming and beyond.

## ENERGY

### Faculty

- **Dr. Soheil Saraji** is an associate professor in the Department of Energy and Petroleum Engineering. He has been a pioneer in applied blockchain research for the oil and gas industry; developed new courses and research initiatives on the topic at UW; and published extensively, including a book examining blockchain technology and its applications in the energy industry. Dr. Saraji is a co-director of the Hydrocarbons Research Laboratory and an adjunct professor for the School of Energy Resources.
- **Dr. Minou Rabiei** is an associate professor in the Department of Energy and Petroleum Engineering. Her research involves data analytics and machine learning tools and techniques, applied in various disciplines related to the energy industry. The primary focus of her research is on predictive analytics, risk management, process optimization and decision making for energy related regulatory compliance issues.





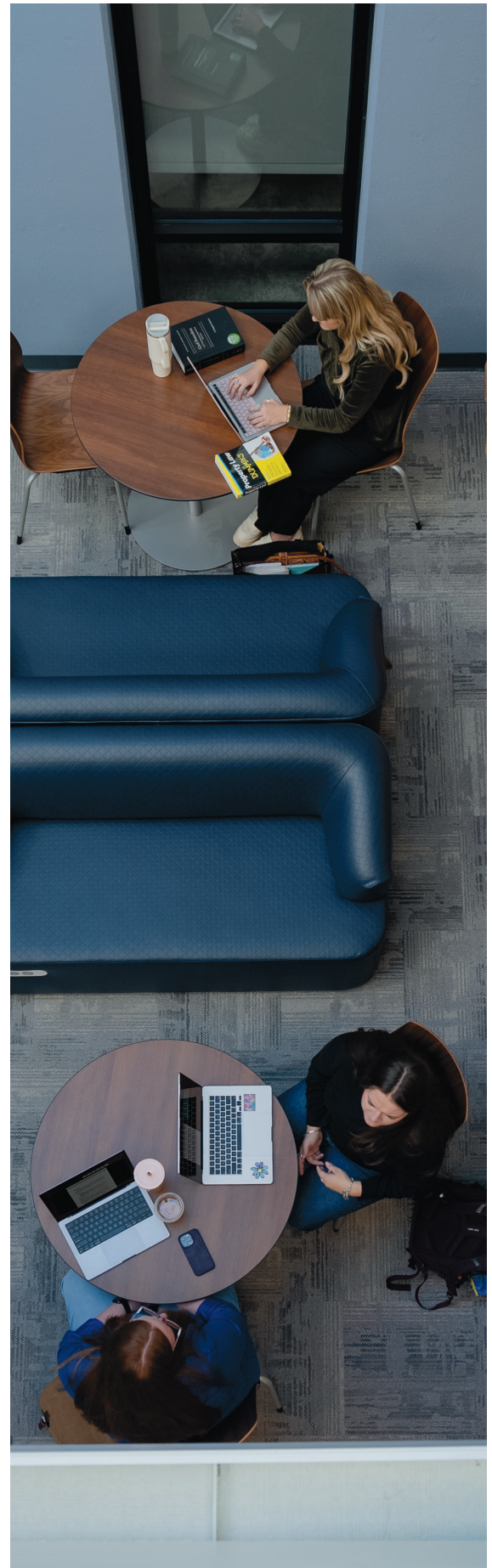
## Programs

- **Subsurface Energy and Digital Innovation (SEDI)** is dedicated to innovative research and finding solutions to energy development challenges in Wyoming. A Center of Excellence at the School of Energy Resources, areas of focus for this new center include blockchain for sustainable energy; big data analytics for energy; machine learning; novel fluids for energy applications using artificial intelligence for laboratory-generated data; and virtual and augmented reality and digital twins.

## BLOCKCHAIN AND DIGITAL INNOVATION

**The Center for Blockchain and Digital Innovation (CBDI)** is an interdisciplinary center focused on emerging technologies to foster innovation, economic development, and education. Engaging multiple colleges in this work, the CBDI is formally partnered with the College of Business, the College of Engineering and Physical Sciences and the College of Agriculture, Life Sciences and Natural Resources.

**The College of Law** created an Entrepreneurship and Business Law Practicum with the assistance of private support. The mission of this practicum is to prepare Wyoming's future lawyers in all areas relevant to strengthening Wyoming's economy while providing pro bono legal serves to Wyoming's entrepreneurs and small businesses. Major foci of this practicum include building capacity for the state's blockchain laws, keeping Wyoming's blockchain and cryptocurrency laws on the cutting edge and ensuring that business and corporate laws that interface with these areas are the most modern and enabling in the work. Recognizing the evolution and growing importance of artificial intelligence, and its ever-increasing synergies with enabling blockchain technologies, the Practicum and its director are expanding their involvement in this area. The Practicum director intends to initiate this effort by devoting a unit of the Practicum's semester to artificial intelligence, which will be taught by an already-identified international expert in the area.







## CONTROLLED ENVIRONMENT AGRICULTURE

### *Faculty*

- **Dr. Yaqoob Majeed** is an assistant professor in the Department of Electrical and Computer Sciences. His research focuses on developing advanced artificial intelligence, computer vision, sensing, automation, and robotics-based solutions to promote sustainable agricultural production both in controlled environments and in-field settings.
- **Dr. Shivanand Venkanna Sheshappanavar** is an assistant professor in the Department of Electrical and Computer Sciences. His research focuses on the intersection of large language models and controlled environment agriculture. Using large vision language models to create virtual agronomist tools which assist farmers and agriculturists with various agricultural (indoors and outdoors) queries, his group aims to create tools which are helpful for insect pest detection/ classification and crop management.

### *Faculty*

- **The Center for Controlled Environment Agriculture (CEA)** was established in February 2023. This new center aims to create technological innovations, develop transdisciplinary education and streamline the commercialization process in CEA. Engaged in this center are the College of Engineering and Physical Science, School of Computing, College of Agriculture, Life Science and Natural Resources, and College of Business.



## AN OPPORTUNITY TO SUPPORT UW

As we launch this Wyoming-centered AI initiative, we are excited by the opportunity to partner with visionary leaders and innovators like you. Your engagement could shape the future of AI in Wyoming and beyond, from funding groundbreaking research projects to creating hands-on learning experiences for students or supporting industry-driven innovation efforts. Together, we can drive the growth of a resilient, AI-capable workforce, foster advancements across sectors, and position Wyoming as a leader in people-centered AI.

Thank you for considering a role in this transformative initiative at Wyoming's university. We look forward to exploring ways to connect your expertise and investment with the University of Wyoming's AI vision.

If you have any questions or would like to visit about being engaged with this initiative or with the University of Wyoming generally, please contact Angela Ver Ploeg at (307) 766-1939 or [angela.verploeg@uwyo.edu](mailto:angela.verploeg@uwyo.edu).



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## ARTICLES AND RESOURCES OF INTEREST

### UW Teams With Safran and Laramie Chamber Business Alliance for AI in Aerospace

*Published June 10, 2024*

Safran Passenger Innovations, a leading provider of in-flight entertainment and connectivity solutions, is collaborating with the University of Wyoming and the Laramie Chamber Business Alliance (LCBA) to leverage artificial intelligence (AI) to optimize the aviation passenger experience.

"This collaboration underscores our commitment to pushing the boundaries of aviation technology," says Matt Smith, CEO of Safran Passenger Innovations. "By partnering with the University of Wyoming and LCBA, we gain access to world-class research and a supportive business environment that will help us create a more connected and enjoyable travel experience for passengers worldwide."

This partnership brings together Safran Passenger Innovations' industry expertise with UW's cutting-edge AI research capabilities and LCBA's commitment to fostering economic growth in Laramie. The goal is to develop innovative solutions to streamline supply chains, enhance traveler experiences in the air and bring more jobs to Laramie.

"We're thrilled to be working with Safran Passenger Innovations and LCBA," UW President Ed Seidel says. "This partnership allows us to apply our AI research to real-world industry challenges, ultimately benefiting travelers and the Wyoming economy. It also provides high-paying job opportunities for our graduates in computing and computer science, including our new master's degree in AI."

Already, Safran Passenger Innovations employs 13 software engineers at its Laramie operation -- temporarily housed in UW's Wyoming Technology Business Center -- with plans to employ 72 by the end of 2025 and eventually grow to 200. The local group is led by Managing Director Gary Townsend.



From left, Brad Enzi, president and CEO of the Laramie Chamber Business Alliance; Matt Smith, CEO of Safran Passenger Innovations; and University of Wyoming President Ed Seidel pause for a photo during a recent event marking a new collaboration among the three entities. Safran Passenger Innovations employs 13 software engineers at its Laramie operation -- temporarily housed in UW's Wyoming Technology Business Center -- with plans to employ 72 by the end of 2025 and eventually grow to 200. (UW Photo)

An example of company-University of Wyoming partnerships we have created.

Full Article can be found here: <https://www.uwyo.edu/news/2024/06/uw-teams-with-safran-and-laramie-chamber-business-alliance-for-ai-in-aerospace.html>

# UW Wins \$4M to Install State-of-the-Art Research Computing System

*Published August 28, 2024*

The University of Wyoming's ability to use artificial intelligence (AI) and high-performance computing to solve problems in areas including the environment, energy, agriculture and public health will take a major step forward through a nearly \$4 million grant to acquire state-of-the-art computing infrastructure from the National Science Foundation (NSF).

The three-year, \$3.9 million award includes \$3.25 million for UW to acquire a specialized high-performance computing testbed composed of 24 nodes of NVIDIA Grace Hopper Superchips with 400 terabytes of data storage, cutting-edge technology that currently is not available in the Rocky Mountain region. An additional \$340,000 will be used for system support and student training.

The award for the "Acquisition of Advanced Infrastructure to Accelerate Impact of AI Through Applications and Innovation for Wyoming (AI4WY)" project was announced this week as part of NSF's Major Research Infrastructure Track 2 Program. UW will have access to 75 percent of the new computing system's capacity, with external partners Colorado State University (CSU) receiving a 15 percent allocation and the Rocky Mountain Advanced Computing Consortium -- composed of 33 institutions in the West, including UW -- receiving 10 percent.

"This award from a highly competitive NSF program is a huge step forward for UW, as it will significantly advance the application and innovation of artificial intelligence and computational science across the university and the Rocky Mountain region," UW President Ed Seidel says. "AI4WY will amplify and build on our recent investments to create our new School of Computing; our existing Advanced Research Computing Center (ARCC); and our partnership with the National Center for Atmospheric Research-Wyoming Supercomputing Center in Cheyenne."

The project's principal investigator is Andrew Kirby, an associate research scientist in UW's School of Computing. Co-principal investigators are Gabrielle Allen, director of the School of Computing; Suresh Muknahallipatna, a UW professor of electrical engineering and computer science, and faculty director for UW computing resources; Michael Killean, deputy director of ARCC; and Michael Kirby, director of CSU's Data Science Research Institute. Multiple UW academic departments are involved, ranging from the departments of Mechanical Engineering and Atmospheric Science to the departments of Anthropology and History.

"Every scientific field and industry have been upended by the emergence of AI, and this award will allow UW researchers to leverage this amazing computing instrument to find new approaches to tackle Wyoming's challenges in a range of fields, including ecological systems, climate, public health, tourism, archaeology, digital humanities and energy from wind, nuclear and petroleum resources," UW's Kirby says. "It also will allow us to accelerate the research and training collaborations that are underway to focus on interstate research problems in our region."

The new high-performance computing system will address two significant computing challenges: data movement and energy consumption. It will allow for the realization of what is called "digital twins" -- a virtual representation of a system characterized by real-time monitoring, simulation and prediction; and adaptive feedback for design and development.

The computing hardware needed for these coupled big-data and modeling algorithms requires state-of-the-art, tightly coupled central processing and graphics processing units with abundant onboard memory, as these problems require high-speed data transmission between processing units. The NVIDIA Grace Hopper Superchip is the only commercially available hardware fitting these specifications.

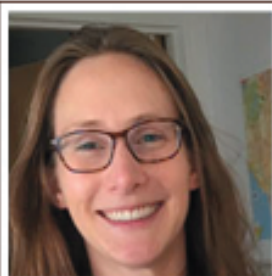
AI4WY specifically highlights four broad areas of research important to Wyoming and the region that present computationally challenging and data-intensive problems: environment, agriculture, energy and society.

"Overall, this platform will provide the foundational cyberinfrastructure for users in all fields to develop and explore transformative AI solutions; it will provide the scaffolding for new collaborations with partners at CSU and across the Rocky Mountain region; and it provides a bridge to national exascale AI resources," Allen says. "This will be a tremendous asset for Wyoming and its university, and the School of Computing is excited to be part of building associated AI research and learning capacity, including the new master's degree in AI that is now available to UW students."



# UW School of Computing Makes Joint Hires in Artificial Intelligence and Big Data

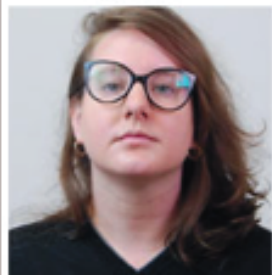
Published July 19, 2023



Ellen Aikens



Sean Field



Meredith Joyce



Benjamin Koger



Stefan Rahimi

The University of Wyoming's School of Computing has taken a major step toward its goal of creating a statewide, national and global impact with the hiring of tenure-track faculty members in applied artificial intelligence/machine learning and big data.

The School of Computing aims to provide Wyoming and the world with agile and ethical computing professionals, empowered to address societal challenges that are inherently interdisciplinary. The new faculty members showcase the breadth of computing envisioned by the school -- and the interdisciplinary nature of the field of computing -- as all have joint positions with other academic units.

"We are delighted to welcome these talented individuals to our team," says Gabrielle Allen, director of the School of Computing. "Their diverse backgrounds and expertise will strengthen our interdisciplinary approach to applied artificial intelligence/machine learning and big data research, creating opportunities for innovation, addressing complex challenges and advancing curricular offerings in the School of Computing and across campus."

This year's new faculty members are:

-- Ellen Aikens, a wildlife ecologist whose research is rooted in applied data science, uses big data techniques to address critical conservation and management issues. She joins UW as an assistant professor, joint with the Haub School of Environment and Natural Resources, and with an adjunct position in the Department of Zoology and Physiology.

She earned a bachelor's degree in biology from Ursinus College and a Ph.D. in ecology from UW. She gained international experience through a postdoctoral position at the Max Planck Institute of Animal Behavior in Germany before her most recent role as an assistant unit leader for the South Dakota U.S. Geological Survey cooperative unit.

Aikens will conduct research at the UW-National Park Service Research Station at the AMK Ranch in Grand Teton National Park, where she will study the full lifetime of ravens, which are well known for their intelligence and problem-solving abilities. For this, her group will develop and apply cutting-edge methods to sensor, camera, movement and activity data.

-- Sean Field, who joins UW as an assistant professor, joint with the Department of Anthropology, and as a UW Derecho Assistant Professor, specializes in archaeological visualization. He earned a bachelor's degree from the University of Northern Colorado in an interdisciplinary major through the Department of Anthropology and holds an M.A. and Ph.D. from the University of Notre Dame in the Department of Anthropology.

Field brings expertise in climate modeling, geospatial analysis and remote sensing. His research revolves around understanding how communities adapt to climate stress in arid environments, using LIDAR technology to visualize and compare archaeological field sites. Field will continue his research in archaeological visualization, exploring the intricate relationship between humans and their changing environments.

-- Meredith Joyce will join UW in 2024 as an assistant professor, joint with the Department of Physics and Astronomy, and adjunct in the Department of Mathematics and Statistics. She holds a B.S. in mathematics and a B.S. in physics from Bucknell University, as well as a Ph.D. in physics and astronomy from Dartmouth College.

Joyce is an expert in computational stellar astrophysics who has trained as a Lasker Data Science Prize Fellow at NASA's Space Telescope Science Institute and is currently a Marie





Dane Taylor

Skłodowska-Curie Widening Fellow at the Konkoly Observatory in Hungary. She specializes in high-performance computing and data science, with a focus on astrophysics, computer science and data science intersections. Her research at UW will center on developing a significant numerical catalog in astrophysics, using large astronomical datasets and the MESA software instrument.

-- Benjamin Koger, joining UW as an assistant professor, joint with the Department of Zoology and Physiology, and adjunct in the Haub School, is an expert in the study of collective animal behavior. He earned a bachelor's degree in electrical engineering from Princeton University and a Ph.D. in biology from the University of Konstanz.

With a strong background in computer science and ecology as a Washington Research Foundation Postdoctoral Fellow at the University of Washington, Koger combines deep-learning techniques and computer vision to generate valuable insights into animal populations and behaviors. His work contributes significantly to the conservation of the natural world.

-- Stefan Rahimi, an assistant professor with a major appointment in the Department of Atmospheric Science, joint with the School of Computing, and a UW Derecho Assistant Professor, was hired through UW's WY-ACT: Wyoming Anticipating Climate Transitions project. He is leading research on hydroclimate shifts and climate projection quality.

Rahimi earned bachelor's and master's degrees in meteorology from the University of Oklahoma and a Ph.D. in atmospheric science from UW. As a regional modeling lead at UCLA, Rahimi has conducted research on understanding and modeling Wyoming's unique weather patterns.

With the support of the National Science Foundation-funded WY-ACT project, Rahimi will explore the integration of artificial intelligence/machine learning methods in weather prediction and climate modeling. He will foster collaboration among the Department of Atmospheric Science, the School of Computing and other departments, driving advancements at the intersection of artificial intelligence/machine learning and atmospheric science.

-- Dane Taylor joins UW as an assistant professor, joint with the Department of Mathematics and Statistics, and adjunct in the Department of Electrical Engineering and Computer Science from the State University of New York-Buffalo. He completed his undergraduate education at UW with bachelor's degrees in physics and electrical engineering, and he completed his M.S. and Ph.D. in applied mathematics at the University of Colorado-Boulder.

Taylor specializes in the study of complex systems using mathematical models. His expertise is in developing algorithms and computational techniques to analyze various types of data, such as networks and interconnected information. His research centers on unraveling the patterns and connections within large datasets to understand the behavior and interactions of complex systems, including neural networks and self-organizing networks. Taylor will facilitate collaboration with colleagues from different disciplines, offering new insights into the behavior and applications of complex systems.

With the exception of Joyce, the new faculty members will begin their work on the UW campus this fall. They will play a crucial role in leading research efforts that directly relate to Wyoming's computing and technology needs. They also will advance the application of artificial intelligence/machine learning and big data in science, technology, engineering and mathematics, specifically tailored to the state's research interests and needs.

# Colorado-Wyoming Climate Resilience Engine Celebrates Launch at UW

*Published May 16, 2024*

A regional effort to expand research and innovation that will shape the future of carbon management technologies has launched at the University of Wyoming and its partners.

A kickoff event for the Colorado-Wyoming Climate Resilience Engine (CO-WY Engine) took place at UW recently, attended by prominent figures, including Gov. Mark Gordon; UW President Ed Siedel; Mike Freeman, CEO and principal investigator of the CO-WY Engine; and Parag Chitnis, UW's vice president for research and economic development.

The CO-WY Engine was one of 10 groundbreaking initiatives nationwide selected to receive funding from the National Science Foundation (NSF) Regional Innovation Engines program. With an initial award of up to \$15 million over two years and potential funding of up to \$160 million over 10 years, the CO-WY Engine is set to be at the forefront of environmental and climate technology innovations.

"As we launch the CO-WY Engine, our commitment extends beyond advancing climate resilience technology; we aim to drive substantial economic development throughout Wyoming. This initiative is not just an investment in our future but a strategy to harness innovation and foster collaboration," Freeman says. "By creating new job opportunities and strengthening our economy, the engine acts as a catalyst for transformative growth, turning regional challenges into opportunities for prosperity. This launch of the CO-WY Engine marks a pivotal moment not only for our region, but for the broader fields of environmental monitoring and sustainable technology."

In addition to UW, the collaborative effort includes major research institutions, such as [Colorado School of Mines](#), [Colorado State University](#), the [University of Colorado-Boulder](#), the [University of Colorado-Denver](#), [Metropolitan State University of Denver](#) and the [University of Northern Colorado](#).

In Wyoming, the state's community colleges, the [Wyoming Business Council](#), the [Department of Workforce Services](#) and UW's [High Plains American Indian Research Institute](#) also play critical roles. Moreover, UW is partnering with the [National Center for Atmospheric Research-Wyoming Supercomputing Center](#) to support this extensive project.

For more information about the CO-WY Engine and to follow its progress, visit [www.co-wyengine.org](http://www.co-wyengine.org).

## About the Colorado-Wyoming Climate Resilience Engine

The CO-WY Engine is a collaborative initiative focused on driving innovation in climate resilience and sustainability across the Colorado-Wyoming region. Supported by the NSF Engines program, the CO-WY Engine brings together a diverse network of partners to develop and commercialize technologies that address critical environmental challenges, fostering economic growth and enhancing community well-being.

## About the NSF Engines Program

Launched by the NSF Directorate for Technology, Innovation and Partnerships in May 2022, the NSF Engines program uniquely harnesses the nation's science and technology research, development enterprise and regional-level resources. For more information, visit the [NSF Engines program website](#).



# UW Launches School of Computing

Published September 18, 2023



**The new school will offer academic programs and serve as an interdisciplinary hub.**

By Micaela Myers

In 2022, the University of Wyoming Board of Trustees approved the creation of the School of Computing, which serves as hub for computing and digital skills. The school aims to provide UW students, faculty and staff — and Wyoming businesses and citizens — with the computational tools and approaches to drive

transformation and innovation in the state.

"The School of Computing is fundamentally about students," says Director Gabrielle Allen. "Across every discipline and every major, employers are looking for students who know how to use computers and data and how to apply that knowledge in novel and interesting ways."

The School of Computing began by launching a minor this fall, helping prepare UW's students for the workforce.

"Employees who have computing skills are poised for success and are better equipped to navigate the rapidly changing digital landscape," says Administrative Associate Judy Yates. "They are more versatile, adaptable and productive and can collaborate more effectively with colleagues and clients. Having basic computing knowledge also opens up new career opportunities in fields of agriculture, business, health care, humanities and many others. Adding our minor to any major increases your learning and earning potential."

Students will learn how to approach problems, utilize software options and work on interdisciplinary teams. Similar to research scholar programs in science and engineering, students can apply to become computing scholars, earning money toward their education along with hands-on research opportunities. An internship program will give students the opportunity to collaborate with Wyoming companies.

The school is also working in partnership with Wyoming community colleges to offer a bachelor's degree in applied software development. Students will complete their software development associate degree from a Wyoming community college and then transfer to UW.

Sheridan College was the first community college to offer the program in fall of 2022, with Western Wyoming Community College and Central Wyoming College offering the degree in the fall of 2024.

"There are many positive forces that aligned at the right time, contributing to the successful creation and launch of this program," says Sheridan College President Walt Tribble. "Funding and support — both from a local Sheridan foundation, Whitney Benefits, and from Gov. Mark Gordon's Wyoming Innovation Partnership program — were instrumental in the speed at which this opportunity was put in place for students and our state. That support and the vision and knowledge of our Sheridan College faculty member Mark Thoney, along with teammates throughout the state, created a model for which everyone can be proud."

Sheridan College Computer Science Instructor Mark Thoney graduated from Sheridan High School and earned his bachelor's and master's degrees from UW in computer science. However, he explains that computer science and computer engineering differ from the new software degrees. One way they differ is requiring less advanced mathematics, which is a barrier for many students or those switching careers.

"While advanced mathematical skills are advantageous for aspects of software engineering and essential for research, advanced mathematics is not required for many software development jobs," he says. "Software development, which could be seen as a subset of software engineering, is concerned with writing, modifying and debugging software that solves business problems with a focus on web applications, automation or mobile app development."

The School of Computing will roll out certificates and graduate degrees in the future. Allen says the school will help provide a bridge between new tech, computer science and applications as well as bring the varied expertise on campus to bear on problems of regional and national importance, including garnering external research funding.

## WyGISC Joins School of Computing

This past summer, the Wyoming Geographic Information Science Center (WyGISC) joined the new School of Computing. WyGISC is an interdisciplinary academic center focused on education, research and development of geospatial technologies, including geographic information science and technologies (GIST), and their applications in science, government, business and other areas. It currently offers a number of certificates and degrees.

"The School of Computing's aim is to provide students with many easy pathways to use the power of computing and technology in their chosen discipline. The existing academic programs in WyGISC fit this model perfectly," says Instructional Professor Beth McMillan. "GIST is computing and technology applied to spatial data in disciplines ranging from geology, botany, atmospheric science, rangeland management, environmental science, business, tourism, urban planning and public health. The School of Computing is planning to develop courses and expertise in other areas like digital ethics, artificial intelligence, big data and supercomputing. All of these will add depth to the existing GIST programs."

School of Computing Director Gabrielle Allen says WyGISC will be well positioned within the school to take advantage of the increasing use of spatial data in augmented and virtual reality. The latest AR/VR headsets overlay digital information on the physical environment. "This will change how individuals interact with their surroundings, opening up new growth areas in computing for navigation, exploration and real-time data visualization," she explains.

# New Center of Excellence in Subsurface Energy and Digital Innovation Opens at UW

*Published July 11, 2024*

A new center dedicated to innovative research and finding solutions to energy development challenges in Wyoming is opening at the University of Wyoming.

UW's School of Energy Resources (SER) -- in partnership with the College of Engineering and Physical Sciences -- is establishing the Center of Excellence in Subsurface Energy and Digital Innovation (SEDI).

SER supports research through its Centers of Excellence model, which facilitates the investigation of energy issues across disciplines. SER will provide seed funding to the new SEDI over five years while it works to establish itself as a leading research center at the intersection of energy solutions and digital technology.

Sohell Saraji, an associate professor of energy and petroleum engineering, will direct the new center. SEDI will be a groundbreaking hub for advancing energy solutions by integrating cutting-edge digital technologies.

"We have found that our Centers of Excellence have yielded successful results over the years in both faculty retention and creating multidisciplinary, solutions-based research," says Scott Quillinan, SER's senior director of research. "SER is grateful for the collaboration with the College of Engineering and Physical Sciences and UW's Department of Energy and Petroleum Engineering to stand up a new center in this exciting field of work. Under Dr. Saraji's leadership, it will be exciting to see the impact from SEDI, which is focused at the juncture of transformative power of digital technologies and energy."

To help kick-start the center and position it for success, a generous gift from Richard and Marilyn Lynch will establish the Richard and Marilyn Lynch Non-Endowed Chair in the Subsurface Energy and Digital Innovation Center.

The \$150,000 gift over five years -- which will be matched by SER -- will support the faculty director and provide a flexible source of funding that will be used to foster excellence in teaching, research and education within the center.

"I am incredibly grateful for the support from Mr. and Mrs. Lynch, the School of Energy Resources and the College of Engineering and Physical Sciences for making this vision a reality," Saraji says. "I believe the Subsurface Energy and Digital Innovation Center will bridge a critical gap between research and application, driving innovation and sustainable development."



Sohell Saraji





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