As a Tier 1 research institution, research is fundamental to what we do in the Department of Computer Science here at NC State University. Our faculty are widely recognized as leaders in their fields conducting impactful and pertinent research. We have had 34 National Science Foundation (NSF) CAREER Award recipients, to date, as well as 10 Institute of Electrical and Electronics Engineers (IEEE) Fellows, three IEEE Golden Core members, three Association for Computing Machinery (ACM) Fellows, and two American Association for Artificial Intelligence Fellows. Additionally, we have numerous recipients of NC State’s top research and mentorship award — the Outstanding Research Award — who are also members of NC State’s Research Leadership Academy. We even have a member of the National Inventor’s Hall of Fame, and a recipient of an Emmy Award from the National Academy of Television Arts and Sciences!

As you may know, two years ago the State of North Carolina recognized the significant growth of science, technology, engineering and mathematics (STEM) workforce-dependent industries in our state, allocating $20M to launch the Engineering North Carolina’s Future initiative. As a result, we have not only seen significant growth in our enrollments, but we’ve made double-digit faculty additions for the second year in a row.

As our department continues to grow, we will continue to add more tenure-track faculty and teaching professors. With these new faculty members and students, we will be able to increase the strength of our research and educational offerings. This expansion will further secure CSC’s position as the preeminent computer science department in North Carolina, and one of the strongest departments in the nation.

We are also happy to report that we are taking significant action to address the adverse impact that inflation has had on our graduate students. A plan was recently approved to increase monthly TA stipends by $300 per month in stages between now and August 2024.

The department’s research productivity continues to reach record levels of support with more than $15 million in new awards, and annual expenditures in the $15.5 million range.
NC State University is one of six universities nationwide to become part of a five-year $20M grant from the National Science Foundation (NSF) and the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) to lead a new National Agriculture Intelligence Research Institute. NC State’s portion of the grant is $500,000, and the lead researcher on the project is Computer Science professor Dr. Rajo Range Kitawat.

Lead by the University of Minnesota Twin Cities researchers at the AI Institute for Climate and Atmospheric Change, Mitigation, Adaptation, Tradeshow and Economy (AI-CLIMATE) aim to leverage artificial intelligence methods to help develop effective, affordable, and scalable solutions that will absorb and store carbon while simultaneously boosting the economy in the agriculture and forestry industries. Using AI techniques like deep learning and knowledge-guided machine learning, researchers at AI-CLIMATE institute are improving accuracy and lowering the cost of accounting for carbon and greenhouse gases in farms and forests, ultimately making the process feasible for more people. The institute will be expand and diversify rural and urban AI workforces.

Dr. Thomas Price, Assistant Professor of Computer Science and Director of the INTREDS lab at NC State, is a part of a team called the Adaptive Experimentation Accelerator, that won the $500,000 grand prize in the XPRIZE Adaptive Experimentation Accelerator. Launched in 2021, the Digital Learning Challenge is a global competition that received teams to modernize, accelerate and improve technology in the education sector. The grand prize in the $500,000 Adaptive Experimentation Accelerator, that won the $500,000 grand prize in the XPRIZE Adaptive Experimentation Accelerator. The Institute will also expand and diversify rural and urban AI workforces.

Dr. Rado Kitawat, Assistant Professor of Computer Science, have demonstrated that the home address of any active user in remote areas can be identified, violating Strava’s privacy claims and posing a threat to user privacy.

The latest weapon in the war on robocalls is an automated system that identifies and locates the caller’s area code by sound. The system looks at the sound of a person speaking on the phone and matches it against a database of known robocalls. This new technology allows regulators, phone carriers and other stakeholders better understand and monitor robocall trends — and take action against illegal robocalls.

Nowadays, a wristwatch can track your heart rate, measure your blood oxygen level and even give you an electrocardiogram test (commonly abbreviated as “EKG” or “ECG”). And plenty of pet owners probably wish they could afford to track their furry friend’s health as well. Thanks to Drs. Donald Bitzer and Alper Bozkurt, maybe one day they can. Robert Wookhee Min, Assistant Professor of Computer Science, have developed a tool that allows them to characterize the content of robocalls, and they’ve done so without violating privacy concerns. They collaborated with a computer science professor at a telecommunications company called Bandwidth to operate more than 63,000 phone numbers that are used solely to monitor unobstructed robocalls.

Here are some other research highlights and prestigious honors, awards and professional accomplishments by our faculty that deserve special recognition:

- Thomas Price, assistant professor of computer science, is part of a team called the Adaptive Experimentation Accelerator that won the $500,000 grand prize in the XPRIZE Adaptive Experimentation Accelerator.

- James Lester has been named the inaugural Goodnight Distinguished Professor in Artificial Intelligence and Machine Learning. Lester is also director of the National Science Foundation AI Institute for Engaged Learning led by NC State and our Center for Educational Informatics.

Some of our research projects appear on page 2 of this newsletter. Please visit our website csc.ncsu.edu to learn more about our research projects, our department, our faculty and our cutting-edge research.
Researchers

Chris Wu, Assistant Professor
Ph.D., Northeastern University, 2019
Algorithmic and empirical evaluation of reinforcement learning and its applications.

Jing-Eun Kim, Assistant Professor
Ph.D., University of Illinois Urbana-Champaign, 2018
Graph-based, multi-agent, and dynamic machine learning, with applications to social sciences.

Jiajie Li, Assistant Professor
Ph.D., University of Michigan, 2016
High-performance computing and its applications to scientific computing, data analysis, and machine learning.

Zhaohui (Helen) Gu, Professor
Ph.D., University of British Columbia, Canada, 2000
Education and interactive narrative.

Bradford Mott, Senior Research Scientist
Ph.D., University of Wisconsin-Madison, 2004
Large-scale distributed optimization, machine learning on graphs, robust and secure data analysis.

Wei Wu, Assistant Professor
Ph.D., University of Maryland, 2016
Information technology and data science.

Chenhan Xu, Assistant Professor
Ph.D., University of Illinois Urbana-Champaign, 2013
Networks and distributed systems, and their applications to cyber-physical systems.

Teaching Professors

Bita Abram, Assistant Teaching Professor
Ph.D., NC State University, 2019
Advanced learning technologies, and improving access and quality of computer science education.

Suzanne Bakal, Assistant Teaching Professor
Ph.D., NC State University, 2016
Graphical human computer interaction.

Cao Binh Danh Le, Assistant Teaching Professor
Ph.D., University of California, Irvine, 2023
Systems problems, emerging behaviors, computer science education.

Luo Baoxiang, Assistant Teaching Professor
Ph.D., NC State University, 2015
Computer science education, cloud computing and datacenter networks, networking architecture.

Alexander Card, Assistant Teaching Professor
Ph.D., NC State University, 2018
Game design.

Wenbin Lin, Assistant Teaching Professor
Ph.D., NC State University, 2019
Cloud computing, virtual environments that can be used to identify, predict and influence behavior and decision making.

Andrew Gavanda, Assistant Teaching Professor
Ph.D., NC State University, 2022
Artificial intelligence and intelligent agents.

Ahida Hague, Assistant Teaching Professor
Ph.D., North Carolina State University, 2023
Cryptography, digital signatures, theory of algorithms.

Sarah Hackman, Alumni Distinguished Undergraduate Teaching Professor
Ph.D., NC State University, 2006
Computer science and software engineering, open educational resources.

Jamie Jennings, Assistant Teaching Professor
Ph.D., Pennsylvania State University, 2014
Theory, programming languages, software engineering, robotics and artificial intelligence.

Shaylin Saez, Assistant Teaching Professor
Ph.D., University of Houston, 2015
Cloud computing, software/hardware co-design.

Jason King, Assistant Teaching Professor
Ph.D., NC State University, 2016
Research for understanding, training and forensics.

Sterling McLeod, Assistant Teaching Professor
Ph.D., North Carolina State University, 2014
Artificial intelligence, robotics and operating systems.

Kevin Moore, Assistant Teaching Professor
Ph.D., University of Oklahoma, Norman, 2014
Computer science education, developing tools and tutorials to improve programming instruction and undergraduate performance, data literacy, effective uses of Edmodo in education.

Jessica Young Schmidt, Associate Teaching Professor
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Computer Science Research

Our key research areas are in:

- **Artificial Intelligence and Theory** including Intelligent Agents, Machine Learning, Knowledge Representation, Planning, Natural Language Processing, Computational Economics and Management, Algorithms, Theory of Computation

- **Computational Applications and Analytics** including Data Intensive Computing, Scientific Computing, Bioinformatics, Data/Text Mining, Information Visualization, Healthcare Information Technology, Analytics Clouds, Data Science

- **Games, Interaction, and Education Informatics** including Games, Human-Computer Interaction, Graphics, Intelligent Tutoring, Undergraduate Education in Computing


- **Software Engineering** including Requirements, Formal Methods, Policies, Reliability Engineering, Process and Methods, Programming Languages, Testing and Verification


NC State University is a Tier 1 research institute, and with 13 research centers and more than 35 research labs and groups, research is at the very core of the NC State Computer Science Department’s mission.