

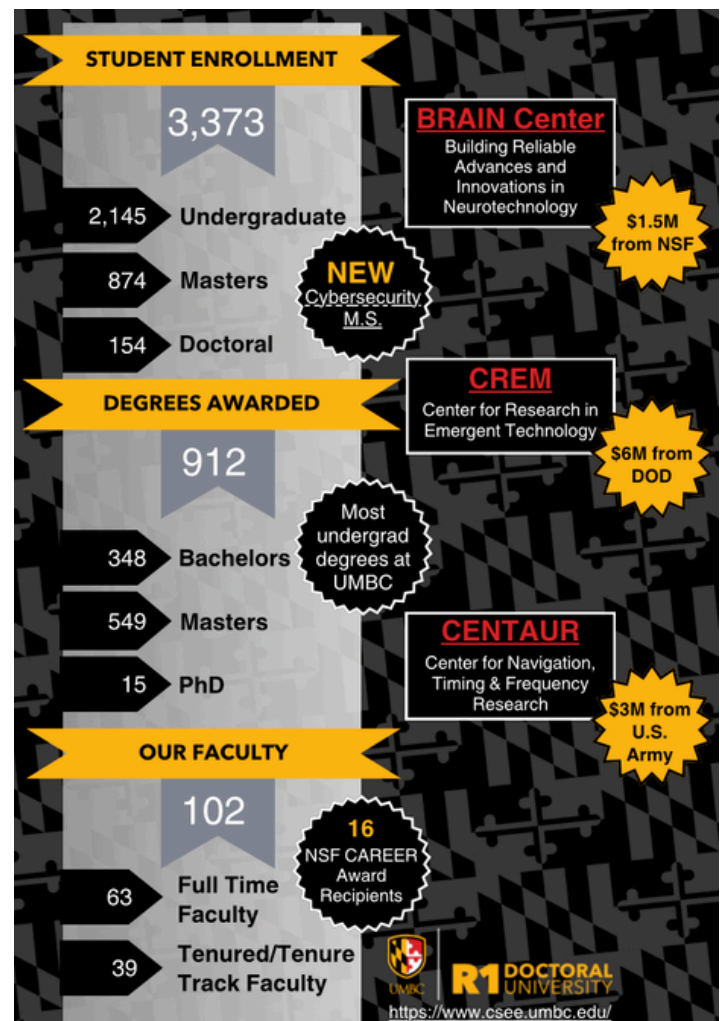


A Message from the Chair

As a new year unfolds, CSEE stands ready, alongside with the UMBC leadership, to serve our students and further elevate the stature and impact of the department. We had an amazing year—a record number of students, increased diversity, new faculty, major growth in research funding, newly established research centers, recognition for our faculty and students, and a renewed ABET accreditation of all our undergraduate degrees. We are also growing our faculty. You'll find this and more discussed in this issue of the newsletter.

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Congratulations

Dr. Frank Ferraro has been promoted to Associate Professor with Tenure.

Dr. Jeremy Dixon and Dr. Kash Donyee have been promoted to Principal Lecturer and Senior Lecturer.

Rebecca Dongarra's title has been updated from Academic Affairs Manager to Assistant Director.



Frank Ferraro



Jeremy Dixon



Kash Donyee



Rebecca Dongarra

Welcome our newest faculty and staff members!



Rajasekhar Anguluri
Assistant Professor
*Systems Theory and
Statistical Learning for
Energy Systems*



Rosie Bacon
Administrative Assistant II
*UMBC Alumna in
Interdisciplinary Studies:
Musical Theater Education*



Keke Chen
Associate Professor
*Security and Privacy
Issues with AI and Trusted
Execution Environments*



Shane Donahue
Lecturer
*Program Analysis and
Verification, Software
Design, Cyber Competitions*



Enis Golaszweski
Lecturer
*Cybersecurity, Computer
Science Education
UMBC Alumnus in CS*



Zeynep Kacar
Lecturer
*Computational Methods
for Cancer, Statistical
Methods in Healthcare*



Taylor Kidd
Professor of the Practice
*Distributed Heterogeneous
Computing, Tracking and
Engineering Education*



Dong Li
Assistant Professor
*Mobile and Wireless
Sensing, Human Computer
Interaction, Smart Health*



Sanaa Mironov
Lecturer
*Data Management, AI,
Privacy, and the IoT,
UMBC Alumna in CS*



Ram Rustagi
Professor of the Practice
*Artificial Intelligence and
Machine Learning for
Air Pollution*



Samit Shivadekar
Lecturer
*Machine Learning,
Cybersecurity
UMBC Alumnus in CS*

Faculty Achievements

Our CSEE Faculty are being recognized near and far

IoT-AHSN 2024 Technical Achievement and Recognition Award

Mohamed Younis, Professor and Chair of the CSEE Department

Dr. Younis has been honored by the IEEE Communications Society for his significant and lasting contributions to the advancement of modern communication technologies. The award was announced December 9 at the society's Global Communications Conference in Cape Town, South Africa. In particular, Younis was honored by the IEEE Technical Committee on internet of things, ad hoc, and sensor networks for his impactful contributions to these frontier areas of communications.



Editor-in-Chief of the IEEE Signal Processing Magazine

Tulay Adali, Distinguished University Professor

Dr. Adali was elected to serve as the Editor-in-Chief of the IEEE Signal Processing Magazine (SPM). With a current impact factor of 9.4, SPM is an influential publication of the oldest society of the IEEE and publishes tutorial-style articles and columns and forum articles on issues of interest to the signal processing and the broader machine learning community. Adali's term started January 2024 and will end at the end of 2026.



"Highlighted New Faculty" at AAAI 2024

Tejas Gokhale, Assistant Professor

Dr. Gokhale delivered an invited talk at the New Faculty Highlights session at AAAI 2024. Through his talk, titled "Towards Robust Visual Understanding: from Recognition to Reasoning", he shared his research on building perception and reasoning models with a focus on benchmarking and improving robustness of data-driven visual understanding systems.



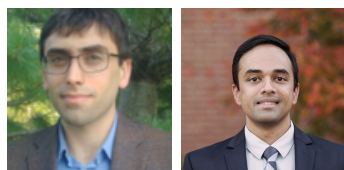
Army Research Laboratory Award for Human-Machine Integration

Cynthia Matuszek, Associate Professor and Tim Finin, Professor

Dr. Matuszek and Dr. Finin organized a Human-Machine Integration workshop at UMBC with support from the Army Research Laboratory. The event brought together 50 researchers from the US Army, academia, and industry to explore the development of AI agents and robots that can collaborate effectively with humans.



Fueling Innovation: External Grants Driving Cutting-Edge Research



UMBC has been awarded a \$3.8 million contract by DARPA for the Scientific Feasibility (SciFy) program to develop computational methods for assessing the feasibility of scientific claims. The aim of this 32-month project is to create algorithms and learning methods for reasoning over claims or statements made in scientific documents, and through that reasoning assess the feasibility of these claims. UMBC is leading a multi-university collaboration between UMBC, Stony Brook University, University of Texas at Austin, and University of Cambridge. Principal Investigator Frank Ferraro (CSEE), co-PI Tejas Gokhale (CSEE), and co-PI Tyler Josephson (CBEE) will direct UMBC's research efforts with their graduate, undergraduate, and post-doctoral researchers.



Dr. Anupam Joshi and Dr. Tim Finin were PIs on research on Optimizing Knowledge Graph Search and Reasoning for Accelerated High-Performance Computing supported by awards from the DoD in 2024 and 2025 totaling \$290k as part of the UMBC Center for Accelerated Real-Time Analytics. The awards support research in developing and using benchmarks to evaluate performance of various knowledge graph systems in answering complex queries on high-performance computing systems.



Collaborating with Phase Sensitive Inc. and Prof. Alireza Marandi's group at CalTech, Drs. Ergun Simsek, Curtis Menyuk, and Gary Carter received the NSF STTR grant to investigate the integration of optical gain medium with thin-film lithium niobate on insulator optical waveguides.



Dr. Naghmeh Karimi secured over \$300k in industry funding from IBM-Research, AMD, and Siemens through the Semiconductor Research Corporation (SRC) to enhance the security of computing-in-memory (CiM) AI accelerators, a promising technology that speeds up machine learning while reducing energy consumption.



Dr. Mohamed Younis received a grant from NIH in collaboration with LASARRUS Clinic and Research Center to develop a wearable-based telehealth system for monitoring and assessing COPD patients. This project aims to enhance remote patient care by leveraging advanced sensing and communication technologies.



Empowering Discovery: Internal Funding Advancing UMBC Research

CSEE faculty received multiple internal funding awards to support innovative research and interdisciplinary collaboration. Dr. Rebecca Williams received the Hrabowski Innovation Fund Grant and was named an Innovation Fellow. Dr. Lara Martin secured the COEIT Interdisciplinary Proposal grant. Dr. Dong Li and Dr. Konstantinos Kalpakakis received the UMB ICTR Pilot Grant Award, while Dr. Tejas Gokhale received CIDER funding (with GESTAR-II) and START funding. Dr. Dong Li, Dr. Tejas Gokhale and Dr. Lara Martin were also awarded SURFF funding.

CSEE Faculty Leading the Field: Prestigious Leadership Roles



Dr. Anupam Joshi (fifth from the left), Dr. Manas Gaur (third from the right), Dr. Tim Finin (second from the right), and Dr. Karuna Joshi with fellow organizers

Drs. Anupam Joshi, Tim Finin, Roberto Yus, Manas Gaur, and Karuna Joshi organized the 23rd International Semantic Web Conference (ISWC) 2024 in Baltimore. ISWC is the premier international forum for the Semantic Web and Linked Data Community.



Dr. Dmitri Perkins (center) with NSF Director Dr. Sethuraman Panchanathan (left) and NSF Chief Science Officer Dr. Karen Marrongelle (right)

Dr. Perkins is returning to UMBC in Spring 2025 after four years at the NSF, where he played a key role in shaping the NSF Regional Innovation Engines (NSF Engines) program. This initiative represents a major investment in U.S. science and technology, driving innovation, economic growth, and job creation across various fields, including semiconductors, biotechnology, and advanced manufacturing.



Dr. Ramana Vinjamuri (left) with other meeting organizers

Dr. Vinjamuri chaired the BMES Annual Meeting in Baltimore, bringing together researchers, industry experts, and practitioners in biomedical engineering. This meeting is a premier forum for advancing biomedical research and innovation.



CSEE faculty continue to lead in research, with Dr. Gokhale, Dr. Younis, Dr. Adali, Dr. Vinjamuri, Dr. Martin, Dr. Gaur, Dr. Li, and Dr. Yus serving as session chairs, workshop chairs, tutorial organizers, area chairs, and guest editors in top conferences and journals. Also, the Imaging Research Center is hosting the Full-Circle Climate Communication Workshop to foster collaboration on climate action.

Sharing Knowledge: CSEE Faculty Invited to Prestigious Talks

CSEE faculty are shaping the global research landscape through invited talks, tutorials, and keynote addresses at top conferences and institutions.

- **IEEE Baltimore Technical Colloquium (2024):** Acting Dean Dr. Anupam Joshi, Department Chair Dr. Mohamed Younis, and Drs. Nilanjan Banerjee, Ergun Simsek, Fow-Sen Choa, and Justin Brooks took the stage to share insights.
- **Conference Tutorials:** Dr. Tejas Gokhale captivated audiences with insightful tutorials at ECCV 2024 and WACV 2024.
- **Keynote Addresses:** Dr. Rick Forno delivered a keynote at CYBERHACKDAYS '24 in Romania. Dr. Mohamed Younis shared his expertise at the SEENE Workshop in Montreal. Dr. Ramana Vinjamuri delivered a keynote address at the Medical Society Angeles Hospital in Ciudad Juarez, Mexico, during the XVII Academic Day, held in celebration of the Angeles Hospital Medical Association's anniversary.
- **Institutional Talks:** Dr. Lara Martin delivered a talk at the JHU Human Language Technology Center of Excellence, while Dr. Ramana Vinjamuri was invited to speak at Manipal Academy of Higher Education (MAHE) and visited U Porto, further showcasing the department's global impact.



Pioneering Innovation: CSEE's Cutting-Edge Research Centers

Building Reliable Advances and Innovations in Neurotechnology (BRAIN)

Led by Director Ramana Vinjamuri, the BRAIN Center advances neurotechnology by bringing together experts in diverse topics, from neural, cognitive, and rehabilitation engineering to neurorobotics, neuromodulation, and ethical artificial intelligence. As an Industry-University Cooperative Research Center (IUCRC), it emphasizes academic research conducted jointly with innovative industry partners, and UMBC's location will facilitate cooperation with biomedical companies.



Center for Research in Emergent Manufacturing (CREM)

The CREM, led by Director Nilanjan Banerjee, is a leader in Digital Manufacturing, Industry 4.0 research and training, Cybersecurity research and training, compliant cloud computing systems, and creating digital enterprises for the global supply chain. The CREM also hosts a state-of-the-art cybersecurity training and research facility, known as a cyber range, specifically focused on digital manufacturing technology—one of only a few in the country.



Center for Artificial Intelligence

UMBC launched the Center for Artificial Intelligence in January 2024, with Professor Tim Finin as its director. This interdisciplinary center supports and promotes AI research, applications, and education across the university. It brings together over 60 faculty members, including 33 from CSEE, working in diverse areas such as robotics, machine learning, natural language understanding, data science, image processing, multi-agent systems, large language models, etc.



Center for Cybersecurity (UCYBR)

Cybersecurity is a top priority for UMBC, Maryland, and the nation. The Center for Cybersecurity has been relaunched as UMBC Cybersecurity Institute (UCI) with renewed permanent state funding. Led by Dr. Anupam Joshi, UCI continues to drive innovation and excellence in the field. With over 35 faculty members conducting cutting-edge research across diverse cybersecurity domains, UMBC remains at the forefront of cybersecurity education and research.



Center for Accelerated Real-Time Analytics (CARTA)

The CARTA Center, led by Director Dr. Karuna Joshi, is an NSF-funded Industry-University Cooperative Research Center (IUCRC) focused on tackling research challenges in real-time analysis of large healthcare and scientific datasets using accelerated and next-generation hardware. Faculty from Rutgers, UMBC, the University of Miami, and ASU collaborate on cutting-edge research supported by industry partners who are members of the center.



Center for Navigation, Time and Frequency Research (CENTAUR)

The CENTAUR, led by Dr. Curtis Menyuk, was established in 2022 to support the Army's evolving Position, Navigation, and Timing (PNT) needs. UMBC partners with the National Center for Manufacturing Sciences (NCMS) to develop an Integrated Photonics Center for this purpose. CENTAUR also collaborates with the Army Research Laboratory and academic partners, including the University of Arizona, George Mason University, UC Irvine, Worcester Polytechnic Institute.



CSEE Making an Impact through Community Engagement

CSEE faculty and students are driving community-focused initiatives to tackle real-world challenges. The Imaging Research Center is developing software to help the United Way of Central Maryland visualize its operations and support its 2025-2029 strategic plan, showcasing technology's role in social impact. Additionally, Prof. Rebecca Williams organized the AAAL undergraduate consortium, guiding students on graduate school and research careers, with Prof. Tejas Gokhale serving as a mentor.

Recent and Upcoming Events & Seminars

hackUMBC 2024

hackUMBC 2024 marked its 10th anniversary with an impressive turnout, welcoming 500 students from local high schools and universities for the fall hackathon. Hosted in person, participants engaged in a 24-hour challenge to create innovative hardware and software projects aimed at solving real-world problems. At the core of hackUMBC is a sense of community, welcoming students of all majors and backgrounds. The event prioritized creativity, encouraging participants to think outside the box and explore new ideas. It only takes one innovative solution to inspire change.



CSEE Welcome Week Research Lightning Talks & Lab Open Houses

In August 2024, the UMBC CSEE Department hosted a successful research showcase, bringing together students and visitors to explore cutting-edge research conducted by faculty and students. The event featured a wide range of projects spanning computer science, computer engineering, and electrical engineering. Attendees engaged with professors, toured research labs, and learned about opportunities in diverse fields. The showcase provided a valuable platform for networking, collaboration, and discovery, inspiring future research and innovation within the CSEE community.



2025 CSEE Research Day

The 2025 CSEE Research Day will take place in early May, featuring both in-person and remote presentations. The event is a celebration of research accomplishments by UMBC CSEE faculty and students in the 2024-2025 academic year.

Ongoing Seminars at CSEE

- **Perception, Prediction, and Reasoning (PPR) Seminar** - Organized by Prof. Tejas Gokhale, this seminar series brings together distinguished speakers from academia, industry, national labs, non-profits, and government to discuss cutting-edge research.
- **Cyber Defense Lab (CDL) Seminar** - Led by Prof. Alan Sherman, the CDL Seminar explores topics at the intersection of cybersecurity, cryptography, and secure computing.
- **Language Technology Seminar Series (LaTeSS)** - Founded by Prof. Lara Martin, LaTeSS highlights research in computational linguistics, AI-driven language technology, and human-computer interaction.



Alumni Spotlight: Inspiring Journeys and Achievements



Dr. Randi Williams completed her Ph.D. studying human-robot interaction and preK-12 education in the Personal Robots group at MIT and is a founding director of the Boston chapter of Black in Robotics. She earned a Bachelor's in Computer Engineering from UMBC in 2016, where she worked with Dr. Nilanjan Banerjee in the Mobile, Pervasive, and Sensor Systems Laboratory on the Inviz project and Flex Gloves projects. She was a Meyerhoff Scholar, a member of the Honors College, and founded HackUMBC. Her projects on social robot learning companions (PopBots) and grade school AI + ethics curricula (How to Train Your Robot) have received coverage from outlets such as The Atlantic, Wired, and the MIT Tech Review. She has received numerous awards, including the Microsoft Research PhD Fellowship, Cambridge Curious Scientist of the Year Award, LEGO Papert Fellowship, and NSF Graduate Research Fellowship.

"UMBC has groomed me into a leader which, as a shy and nerdy freshman, I never imagined that I could be... Mentors placed me in the position to speak before the world and lead other students in promoting diversity in technology."

- Randi Williams

Randi Williams

Photo by Marlayna Demond '11 for UMBC

Stephanie C. Hill, a UMBC alumna with a degree in computer science and economics, is the President of Lockheed Martin's Rotary and Mission Systems, leading a \$16 billion enterprise. With a career spanning key leadership roles, she has driven innovation in defense and cybersecurity. Recognized as the U.S. Black Engineer of the Year and one of the most influential Black executives in corporate America, Hill is a dedicated mentor and leader in the STEM community.



William Rowell '90, computer science, retired as a captain from the Commissioned Corps of the U.S. Public Health Service in early 2024 after 30 years of service.

Tina Williams-Koroma '00, computer science, was featured in the Baltimore Business Journal's "People on the Move in Baltimore" list. As the leader of CyDeploy, she is driving innovation in cybersecurity and organizational resilience.

Delali Dzirasa '04, computer engineering, CEO of Fearless, was a finalist for the 2024 WashingtonExec Chief Officer Awards. His Baltimore-based company focuses on building impactful digital solutions that empower organizations and their communities.

Showcasing Excellence: CSEE Students Present at Top Conferences

CSEE students are making waves in research and innovation! Ph.D. student Ishraq M. Anjum, advised by Prof. Ergun Simsek, showcased his groundbreaking work on photodetectors at the prestigious IEEE Photonics Conference in Rome, Italy. Meanwhile, Sourajit Saha, advised by Prof. Tejas Gokhale, is making an impact with his research on shift invariance in convolutional neural networks, earning a coveted spot at WACV 2025. His dedication was further recognized with a DEI Scholarship and UMBC GSA's travel grant, highlighting his perseverance and commitment to fostering inclusivity in research.