

# CAIR QUARTERLY



**ON THE COVER:** CAIR's summer interns display their certificates of completion, marking the end of a rigorous, 10-week research experience. Read more on pg. 18.

## Director's Note

from Dr. Metin Gurcan

"This fall, we proudly celebrate the second anniversary of the Center for Artificial Intelligence Research (CAIR). Since our founding in October 2023, CAIR has become a hub for collaborative, high-impact research at the intersection of artificial intelligence and healthcare. Our momentum continues to build, fueled by innovation, education, and a shared commitment to improving patient outcomes.

We recently welcomed our 500th member, Dr. Brian Hiestand, whose expertise in emergency medicine and informatics reflects the growing breadth of our

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## FOX8 WGHP Spotlights Dr. Mohammad Moghimi's Breakthrough Hearing Aid

Mohammad Moghimi, PhD, Assistant Professor of Biomedical Engineering and a CAIR faculty member, recently appeared on FOX8 WGHP's "House Calls" segment to discuss his team's development of a flexible, noninvasive hearing aid for people with conductive hearing loss.

Using tiny micro-epidermal actuators, the device transmits sound vibrations straight to the cochlea and completely bypasses the ear canal - a technology four years in the making.

"[The hearing aid] absorbs sounds from the environment, generates vibrations on the skin behind the ear, and enables patients to hear sounds," Dr. Moghimi explained to FOX8's Brad Jones. "This is noninvasive and very soft on the skin, especially for children."

Click the screenshot below to watch the [full report](#).



Looking for more video content? Check out the latest from @WakeForestAI on YouTube:

[CIALAB Researcher Spotlight: Erin Proctor](#)

[AI-IA Seminar: "Predictive Models in Pathology"](#)

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### News & Notes

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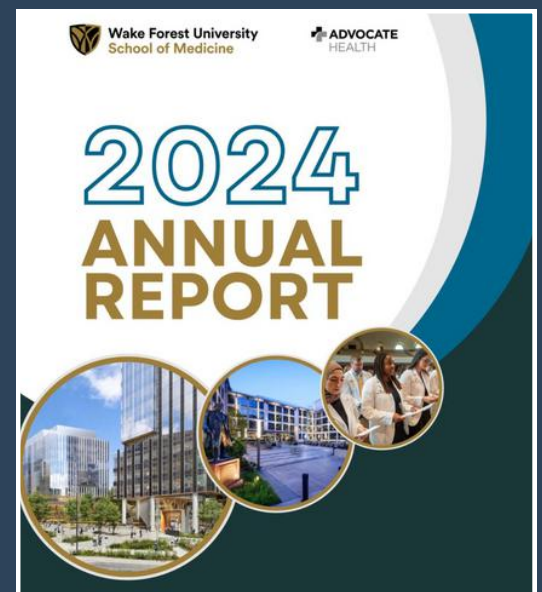
### Professional Development

[Recent Events](#)

## WFUSM's Annual Report

The Wake Forest University School of Medicine released its 2024 Annual Report, which offers an in-depth look at the accomplishments that defined the previous year.

[Click here to view the report.](#)



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To stay updated on CAIR research, events, and more!



# Director's Note

(continued)



Metin Gurcan, PhD

of our interdisciplinary community. This milestone underscores CAIR's expanding role in shaping the future of AI in medicine.

The CALIBIR internship program, supported by our NIH R25 award, concluded another successful summer. This 10-week immersive experience provided research opportunities for students from underrepresented backgrounds, many of whom explored AI applications in maternal health, cardiovascular disease, and digital pathology. We thank our faculty mentors for their outstanding guidance.

In August, CAIR co-hosted the Collaboration-in-Action pilot forum with the Center for Translational Eye and Vision Research (TrEVR). This initiative catalyzed new partnerships and sparked AI-driven proposals in vision science—a testament to the power of interdisciplinary engagement.

A major milestone this fall was CAIR's presence at Medical Student Research Day (MSRD). For the first time, the event featured a dedicated Artificial Intelligence research category, with ten student posters. Four students completed their summer research in CAIR labs, and three were honored with top awards:



### **Translational Science Award - T2: Bedside to Community**

Robert Lipsit and Ava McKane  
Projects on AI for Optimizing Referrals  
and Predicting Skeletal-Related  
Events in Metastatic Bone Disease  
Mentors: Dr. Cynthia Emory and myself

### **MSRD Excellence Award**

Erin Proctor  
Machine Learning for Maternal  
Health Interventions: Predicting  
Postpartum  
Psychiatric Hospitalization  
Mentors: Dr. David Stamilio and  
myself

These recognitions reflect the growing integration of AI into clinical education and highlight the importance of research mentorship in advancing medical innovation.

As we look ahead, I invite you to remain actively engaged—through your research, your mentorship, and your ideas. Together, we are building a dynamic, inclusive, and forward-looking community that is redefining the role of AI in medicine. 🏆

Warmest regards,

Dr. Metin Gurcan  
Director, Center for Artificial Intelligence Research  
Senior Associate Dean, Artificial Intelligence  
Wake Forest University School of Medicine

## Dr. Oguz Akbilgic Promoted to Full Professor, Cardiovascular Medicine

**Oguz Akbilgic, PhD**, a CAIR faculty member, has been promoted to full professor within the Section of Cardiovascular Medicine at the Wake Forest School of Medicine (WFUSM).

Dr. Akbilgic, a biomedical informaticist with expertise in AI and statistical modeling, joined WFUSM as an Associate Professor in 2021. His research spans cardiovascular disease detection and prediction, early identification of movement disorders, and remote patient monitoring, among other areas.

As a faculty member of the Wake Forest Center for AI Research (CAIR), he has advanced the application of AI in medicine through translatable research.



**Dr. Akbilgic presents his work at Advocate Health’s 2025 “Celebrate Research!” event.**

Building on this work, he is leading a research project titled, *Remote Assessment of Brain Natriuretic Peptides (BNP) to Improve Heart Failure Management*, for which he was awarded the Wake Forest University Center for Remote Health Monitoring's Flagship Pilot Award. His co-investigators are **Olivia Gilbert, MD**, **Ryan McGinnis, PhD**, and **Ibrahim Karabayir, PhD**.

"Brain natriuretic peptide (BNP) levels are a cardiac biomarker indicative of both presence and worsening of heart failure," Dr. Akbilgic explains. "Our team previously showed that, using AI, we can accurately estimate BNP from a single-lead clinical ECG. In this project, we aim to prove that our ECG-AI model can estimate BNP even from single-lead smartwatch ECGs, which has potential to revolutionize heart failure management."

Dr. Akbilgic is also a dedicated educator and mentor, working closely with students in CAIR's annual summer internship program and its student chapter, Future of Artificial Intelligence Research (FAIR).

Wake Forest CAIR congratulates Dr. Okbilgic on this well-deserved promotion and looks forward to his continued leadership in AI-driven medical research. 🏆

## Dr. Meredith Adams Named to “100 Women in Health IT to Know” List

CAIR faculty member **Meredith Adams, MD**, has been named to the Becker’s Hospital Review’s 2025 “100 Women in Health IT to Know” list, which is a national list recognizing women who are transforming the future of healthcare through innovation, leadership, and impact.

Dr. Adams is an Associate Professor of Anesthesiology, Biomedical Informatics, Physiology & Pharmacology, and Public Health Sciences at the Wake Forest University School of Medicine. She is a practicing physician and an AI researcher whose work bridges data science, clinical care, and systems innovation. In addition to being named to the Becker’s Hospital Review’s List, she was honored with the NIH HEAL Initiative’s 2024 Golden Neuron Award in the “Rising Star researcher” category.



**Meredith Adams, MD**

Becker’s praised Dr. Adams as an “innovator at the intersection of clinical care, data science and health IT”. She leads an expansive research portfolio exceeding \$26 million in NIH HEAL Initiative funding and serves as the principal investigator for three national research centers focused on improving data-driven solutions for chronic pain and opioid use disorder. Her work is advancing policy, driving interoperability, and strengthening the infrastructure of pain and addiction research across the country.

Dr. Adams is currently working with **Dr. Amber Brooks**, Associate Professor in Pain Medicine and Anesthesiology from the Wake Forest University School of Medicine on a project titled: “Developing a Diverse Workforce: Advancing Data Science for Addiction Research and Professional Training” (ADAPT). This project supports NIH National Institute on Drug Abuse (NIDA)’s mission to train a diverse group of researchers to do high-quality work in addiction data science. ADAPT is focused on building a national training infrastructure to support individuals from underrepresented groups in becoming future leaders in addiction data science. Through an inclusive mentorship model, innovative training strategies, and a focus on long-term career development, the project aims to equip the next generation of researchers with the skills and support needed to address urgent public health challenges related to pain, addiction, and health equity.

Congratulations to Dr. Adams on this well-earned recognition. 🏆

# 500 Members and Counting!

*Introducing Brian Hiestand, MD, MPH, CAIR's 500<sup>th</sup> Member*

A seasoned emergency medicine physician and professor at Wake Forest University School of Medicine, Dr. Hiestand brings over two decades of clinical and academic experience to our community. We caught up with Dr. Hiestand to learn more about his journey, insights, and what drew him to join us. Read on for the full interview!



Brian Hiestand, MD, MPH

## **What inspired you to join CAIR, and how did you first hear about it?**

I've been aware of Dr. Gurcan's work for some time, but my awareness of the actual Center itself crystallized on a follow-up meeting to the recent Research Symposium on AI. Dr. Gurcan mentioned that membership was open for interested individuals, and I took the opportunity to formally indicate my interest in the field.

## **Can you share a bit about your background and what draws you to the field of AI?**

I am an Emergency Physician who is also board certified in Clinical Informatics. I also obtained an MPH with a concentration in Clinical Research / Biostatistics. I have trained as an Epic Physician Builder, and have been involved in a host of clinical implementation projects with multiple EMRs. The common thread with all of these comes down to figuring out how data can best serve the mission of patient care. I am optimistic that we can harness AI to corral and clarify the massive data cloud that now obscures health care as much as it informs it.

## **What areas of AI are you most interested in, and why?**

I am most interested in direct clinical application of AI in clinical decision support – surfacing information that is not immediately apparent, connecting data from different sources, and recognizing patterns can not only predict impending clinical issues, but also recommend potential solutions.

## **Are there any current AI-related projects or research topics you're working on? If so, please explain briefly.**

The biggest issue in the ED is demand – supply mismatch, driven mostly by the boarding of inpatients in the ED. While the holy grail would be to address inpatient capacity via AI, in the interim we are looking to develop a model that not only identifies when we are likely to get underwater, but do it in a time frame such that we can intervene prior to actually starting to capsize. Ideally, the algorithm would also be able to suggest, from a menu of options, which actions would most likely be successful at avoiding surge.

# 500 Members and Counting!

## What do you hope to gain from being part of Wake Forest CAIR?

It's always inspiring to be in the company of really smart, really driven individuals.

## How do you see AI shaping the future of your field or industry?

Unlike some, I do NOT see AI replacing the role of the physician, especially in Emergency Medicine. EM has to make important decisions, very quickly, with limited apparent information. The ability of AI to surface and synthesize from the data cloud will greatly assist this decision making. Ambient AI assistive transcription is already a game changer in terms of clinician well-being. And if we can fix inpatient throughput and capacity management, the impact on ED operations will be profound.



Brian Hiestand, MD, MPH

## What would you like to see CAIR focus on or achieve in the next few years?

Cross disciplinary collaboration will define our ability to succeed as an enterprise.

Dr. Hiestand's perspective offers a compelling glimpse into how AI can be a transformative force in emergency medicine and beyond. His emphasis on practical, data-driven solutions, especially in high-pressure environments like the ED, underscores the urgent need for innovation that is both intelligent and actionable. As CAIR continues to grow, voices like Dr. Hiestand's will be instrumental in shaping a future where interdisciplinary collaboration drives meaningful change in healthcare delivery.

We're grateful to Dr. Hiestand for sharing his insights and for being an engaged member of the CAIR community. His perspective highlights the kind of thoughtful, interdisciplinary dialogue we hope to foster through our work. As CAIR continues to grow, we remain committed to connecting researchers, clinicians, and innovators across fields to explore the transformative potential of AI in healthcare. Stay connected with us on LinkedIn and YouTube for more interviews, updates, and opportunities to collaborate as we shape the future together. 🏥



# Forging New Frontiers in Vision Science

## *CAIR and TrEVR Launch Joint Pilot Partnership*

**V**ISION SCIENCE IS ENTERING A NEW ERA THANKS TO ARTIFICIAL INTELLIGENCE, WHICH IS GIVING ophthalmologists powerful and precise new ways to see the eye itself.

The potential of AI in vision health came into focus at “Collaboration in Action: a Joint Pilot Program,” a scientific forum hosted by the Wake Forest School of Medicine’s Center for AI Research (CAIR) and Center for Translational Eye and Vision Research (TrEVR). Held on August 28 at Wake Forest Biotech Place, the afternoon event spotlighted emerging AI applications in vision science and brought together researchers interested in competing for a \$50,000 pilot award jointly funded by the two centers.

After welcoming remarks from CAIR Director **Metin Gurcan, PhD**, the forum opened with a keynote presentation by **Dr. Sina Farsiu**, professor of biomedical engineering at Duke University. Dr. Farsiu shared groundbreaking work at the

intersection of adaptive optics imaging and AI. His team has developed a computational imaging technique that compresses and reconstructs ultra-detailed retinal scans, software that



**Sina Farsiu, PhD**

improves consistency in disease grading for clinical trials, and a handheld 3D eye-imaging device capable of capturing high-resolution images of pediatric eyes.



**Atalie Thompson, MD, MPH**



**Da Ma, PhD**



**Mohammad Moghimi, PhD**

The program continued with brief research spotlights from Dr. Atalie Thompson, ophthalmologist at Atrium Health Wake Forest Baptist Eye Center, and CAIR faculty members Dr. Da Ma and Dr. Mohammad Moghimi. Each presenter offered insights into their current work and identified opportunities for interdisciplinary collaboration.

Attendees enjoyed a catered lunch and time to network, explore shared interests, and begin forming teams to pursue the pilot award.

We look forward to the innovative proposals that will emerge from this partnership and to the future breakthroughs they will inspire. 🏆



**Attendees network during lunch to foster new connections.**



Ibrahim Karabayir, PhD



Majid Afshar, MD, MS



Arezoo Movaghar, PhD

## CAIR Hosts Annual Colloquium Focused on AI and Remote Monitoring in Healthcare

On Thursday, October 10, CAIR held its annual Colloquium at Biotech Place in Winston-Salem, bringing together researchers, clinicians, and industry leaders to explore the theme: “Streamlining Remote Monitoring of EHRs”.

The event opened with a welcome address from CAIR director **Metin Gurcan, PhD**, setting the tone for a day of innovation and collaboration. The morning featured two flash talks from CAIR faculty members.

**Ibrahim Karabayir, PhD** presented on how artificial intelligence can analyze ECG data to predict cardiovascular outcomes and support remote monitoring, offering a

proactive approach to heart health.

**Arezoo Movaghar, PhD** shared how AI is being used to detect and treat rare diseases, highlighting its potential to close diagnostic gaps and improve care for underserved populations.

The keynote address was delivered by **Majid Afshar, MD, MS**, from the University of Wisconsin-Madison. His talk, “Bedside Implementation and Evaluation of AI Systems Focused on Electronic Health Record Notes”, explored real-world applications of natural language processing and large language models in clinical settings, emphasizing their role in enhancing decision-making at the bedside.

**Epic Systems** also joined the event to present their latest AI innovations in healthcare, showcasing how their tools are being integrated into clinical workflows to improve efficiency and patient outcomes.

Following a networking lunch, attendees explored 17 poster presentations highlighting research from trainees and early-stage investigators. The afternoon concluded with a panel discussion featuring Dr. Afshar, Epic Systems representatives, Dr. Karabayir, and Dr. Movaghar, who answered audience questions and expanded on themes from earlier sessions.



Epic Systems representative

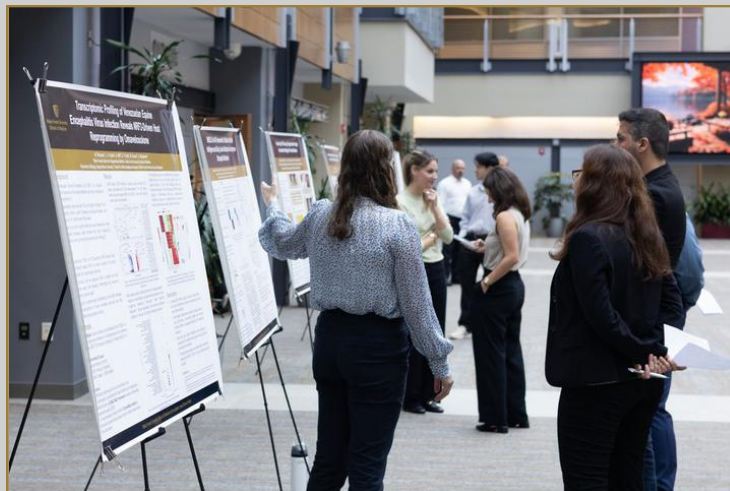


Panelists answer audience questions. From left to right: Epic Systems representative, Dr. Arezoo Movaghar, Dr. Ibrahim Karabayir, and Dr. Majid Afshar

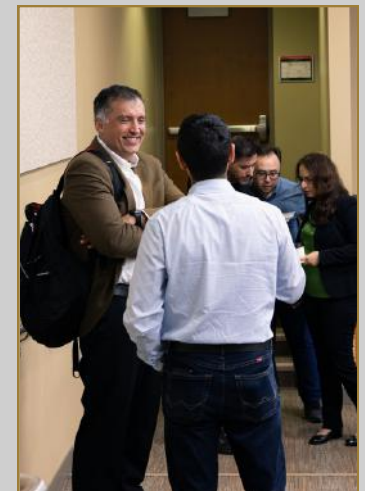
The event wrapped up with the announcement of two Trainee awards and two Early-Stage Investigator awards. Congratulations to Ava McKane and Gabriella Puchall for winning the Early-Stage Investigator award and to Brad Rowland, MD and Mostafa Rezapour, PhD for winning the Trainee award! All award winners received \$1,500 to be used to attend and present at an AI-related conference or to enroll in an AI certificate program.



Dr. Stephen Downs engages with a poster session



Judges engage with Wake Forest University School of Medicine student Ava McKane as she presents her research poster



Colloquium attendee speaks with keynote speaker, Dr. Majid Afshar

Thank you to all who participated and helped make this year's Colloquium a success. We look forward to continuing the conversation around AI, EHRs, and the future of healthcare innovation. 🏆

# Recipient Named for CAIR and UNC Charlotte's AI4Health Center Joint Pilot Award

Atalie Thompson, MD, an ophthalmologist at the Atrium Health Wake Forest Baptist Eye Center at Davie Medical Center, has been selected as the inaugural recipient of a \$50,000 joint pilot award from the Wake Forest Center for Artificial Intelligence Research and the University of North Carolina at Charlotte's AI4Health Center.

Dr. Thompson leads a multidisciplinary research team including Minhaj Nur Alam, PhD, Shaketa Gillis, Sina Gholami, Tania Haghghi, and Ahammed Sakir Nabil. Their project, titled Vision-Language Model Integrated Point-of-Care Diagnostic Tool for Diabetic Retinopathy Using Color Retinal Imaging, aims to revolutionize how diabetic retinopathy is detected and managed.

Diabetic retinopathy is a serious complication of diabetes that can lead to vision loss or blindness if not diagnosed early. Dr. Thompson's team is developing a portable vision-language model (VLM) integrated with a handheld retinal camera. This innovative

tool is designed to generate clinical summaries and predictions at the point of care, enabling healthcare providers to screen patients wherever they are, especially in rural and underserved communities.

The team will use the funds to support clinical performance evaluation of the algorithm, feasibility testing in community-based screening settings, and feedback collection from healthcare providers and patients to refine the tool for real-world use.

This pilot award marks the beginning of a promising collaboration between CAIR and UNC Charlotte's AI4Health Center, two institutions committed to harnessing the power of artificial intelligence to improve healthcare outcomes.

We are proud to support Dr. Thompson's innovative research and look forward to the impact her team's work will have on the future of accessible eye care. 🏆



**Atalie Thompson, MD**

# CAIR Faculty Member Awarded NIH Grant to Advance AI-Driven Alzheimer's Research

Da Ma, PhD, Assistant Professor of Gerontology and Geriatric Medicine and a faculty member at the Center for Artificial Intelligence Research has been awarded a prestigious R01 grant from the National Institute on Aging (NIA), part of the National Institutes of Health (NIH). The grant totals \$770,558 and will support groundbreaking research into the genetic and neurological factors driving Alzheimer's disease.

Dr. Ma's multi-year project will harness the power of artificial intelligence to integrate genomic risk factors with brain imaging data, aiming to uncover how distinct biological subtypes of Alzheimer's develop and progress. By analyzing a large and diverse dataset that includes genetic, neuroimaging, and clinical information, the research seeks to explain why Alzheimer's manifests differently across individuals and how these differences can inform more personalized and effective treatments.



**Da Ma, PhD**

“Alzheimer's disease is a multifactorial disease with markable heterogeneity in neurodegeneration and neuropathological patterns as well as clinical presentations, yet the genotype-phenotype connection remains poorly understood,” Dr. Ma says. “Our study aims to bridge this gap by linking genomic risk factors to distinct neuropathological subtypes and clinical trajectories, enabling precise prediction of disease progression. This integrated approach could lay the groundwork for truly personalized interventions and disease-modifying treatments.”

This research has the potential to transform how Alzheimer's and related dementias are diagnosed and treated, moving the field closer to early interventions that could slow, or even prevent, disease progression.

Congratulations to Dr. Ma and his team for this significant achievement and their continued commitment to advancing Alzheimer's research through innovation and collaboration. 🏆

# Machine Learning Uncovers a Reliable Genetic Marker for Ebola Infection

New research led by **Mostafa Rezapour, PhD**, a faculty member at CAIR, in collaboration with **Aarathi Narayanan, PhD**, **Metin Gurcan, PhD**, and **Wyatt Mowery**, has identified a robust genetic marker for Ebola using advanced machine learning techniques.



**Mostafa Rezapour, PhD**



**Aarathi Narayanan, PhD**



**Metin Gurcan, PhD**



**Wyatt Mowery**

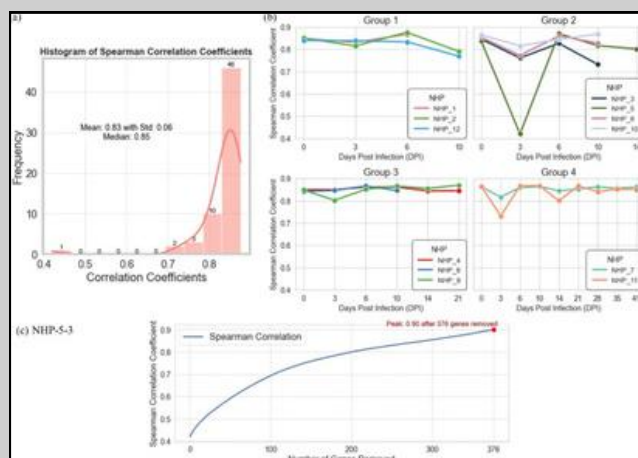
The study, published in BMC Genomics, evaluated two leading technologies – RNA sequencing (RNA-Seq) and NanoString – to assess their effectiveness in detecting Ebola infections.

By analyzing gene expression data from Ebola-infected non-human primates, the team found strong agreement between the two platforms and identified OAS1 as a consistently reliable marker of infection.

The study also revealed a broader immune response, with RNA-Seq detecting additional antiviral genes not captured by NanoString, suggesting RNA-Seq may offer a more comprehensive view of host-pathogen interactions.

This research validates the use of both RNA-Seq and NanoString in Ebola diagnostics and positions OAS1 as a key genetic signal for infection. These findings could lead to faster, more accurate diagnostic tools and deepen our understanding of how the immune system responds to high-risk pathogens.

**Read the full study here: [Assessing Concordance Between RNA-Seq and NanoString Technologies in Ebola-Infected Nonhuman Primates Using Machine Learning](#)**



**Histogram and time-course analysis of Spearman correlation coefficients between RNA-Seq and NanoString gene expression data.**

## **Invitation to Contribute to AI Research Project Inventory**

**As part of Wake Forest CAIR's ongoing efforts to highlight and support the innovative and high-impact work being undertaken in our community, we are compiling an inventory of AI research projects at Advocate Health (including Aurora Healthcare, Advocate Healthcare, and Atrium Health) and the Wake Forest University School of Medicine.**

### **What Is an "AI Research Project"?**

**An AI research project encompasses any research initiative that involves developing or applying AI technologies.**

**This includes, but is not limited to, projects focusing on machine learning, deep learning, AI algorithms, computer vision, natural language processing, robotics, and AI applications in various disciplines. The aim is to understand, augment, or create systems that exhibit some form of human-like intelligence or autonomous decision-making.**

**To ensure your project is included in this inventory and to foster collaboration and awareness within our community, we kindly ask you to complete [this questionnaire](#), which seeks to gather essential information about your project.**

**Please complete the questionnaire as soon as possible. Your contributions are invaluable, and we believe that this inventory will serve as a vital resource for fostering collaboration, securing funding, and showcasing our collective achievements in AI research. 🏆**

## AIM Launches AI Research Database for Medical Students

**AI in Medicine (AIM)**, a student-run organization at Wake Forest University School of Medicine, is excited to announce a new initiative to support medical student engagement in AI-focused research, in collaboration with CAIR. Our goal is to develop a dynamic database of projects and mentorship opportunities to connect students with faculty and researchers. AIM hopes to make it easier for students to explore AI in medicine, build meaningful collaborations, and gain hands-on experience in this rapidly evolving field.



**Erin Proctor**  
AIM President



**Ava McKane**  
AIM Communications Chair

We are currently seeking contributions from faculty, research coordinators, and clinicians who may have project ideas, ongoing studies, or a willingness to serve as mentors. Opportunities of all kinds are welcome - from short-term exploratory projects to more extensive collaborations.

The database will include: mentor name and contact information, project area or topic of interest, medical student roles and responsibilities, expected time commitment, and anticipated project timeline.

If you have a project idea or are willing to support a student's idea, please email the AIM Executive Board (Erin Proctor, [erin.proctor@wfusm.edu](mailto:erin.proctor@wfusm.edu) or Ava McKane, [ava.mckane@wfusm.edu](mailto:ava.mckane@wfusm.edu)) or AIM faculty advisor, Dr. Metin Gurcan, [metin.gurcan@advocatehealth.org](mailto:metin.gurcan@advocatehealth.org).

Erin Proctor and Ava McKane worked with CAIR during their Medical Student Summer Research Internship this past summer. Erin shared, "I really enjoyed learning from AI specialists and developing my coding skills in the direct context of maternal health outcomes, CAIR helped to bridge my passion for medicine and analytics." Ava also said "Initially, I was nervous to begin working with AI because I didn't have much experience with it, but I am so glad I had the opportunity to explore the field and learn from experts, especially given the growing relevance and applications to patient care." 🏆

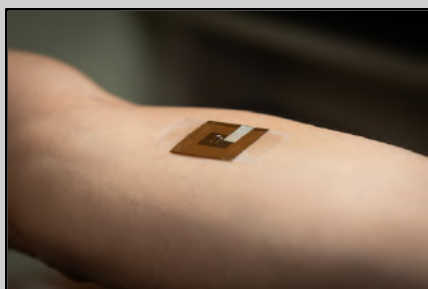
## Dr. Moghimi Leads Development of Non-Invasive Skin Cancer Patch

Dr. Mohammad Moghimi, Assistant Professor of Biomedical Engineering and faculty member at the Wake Forest Center for Artificial Intelligence Research, is leading groundbreaking work in the fight against skin cancer. His latest research, published in *npj Biomedical Innovations*, introduces a novel wearable patch designed to detect melanoma in a way that's simple, affordable, and accessible to more people.

Unlike traditional skin cancer screening methods that rely on visual inspection or invasive procedures, this new patch uses bioimpedance, which refers to how electrical signals pass through skin tissue, to identify abnormalities. The patch is completely battery-free and chip-less, making it lightweight, disposable, and easy to use outside of clinical environments.



**Mohammad Moghimi, PhD**



In early testing, the patch was placed on both healthy skin and pigmented lesions of volunteers. The results showed clear differences in electrical properties between normal and potentially cancerous tissue, regardless of skin tone. This suggests the patch could be a powerful tool for identifying suspicious lesions that may otherwise go unnoticed.

Dr. Moghimi's goal is to make early detection more accessible, especially for individuals who may not have regular access to dermatology care. By offering a comfortable and objective screening method, this technology could help reduce unnecessary biopsies and improve outcomes through earlier diagnosis.

The research team is already working on the next phase, which includes refining the patch with conductive hydrogel materials and expanding clinical trials to evaluate its performance in broader, real-world settings.

Congratulations to Dr. Moghimi and his team for pushing the boundaries of biomedical engineering and advancing patient-centered innovation.

**Read the full publication:** [Wearable Battery-Free Chip-Less Patch for Bioimpedance Measurement of Cutaneous Lesions](#) 

# CAIR Hiring Two AI Analysts for Newly Created AIMS Unit

Wake Forest CAIR is launching an **Artificial Intelligence Modeling & Solutions (AIMS)** unit and is accepting applications for two AI Analysts to join the team.

## What is AIMS?


AIMS puts CAIR's vision into action by developing and deploying AI-powered solutions that advance institutional priorities across clinical care, education, and strategic planning.

## Responsibilities of the AI Analyst:

- Design and implement predictive models using AI/ML on structured and unstructured data
- Perform data preprocessing, feature engineering, and rigorous model validation
- Collaborate with clinicians, educators, and administrators to shape projects and interpret findings
- Evaluate and address fairness, bias, and explainability in AI systems
- Turn insights into action via dashboards, briefings, and stakeholder presentations
- Contribute to strategic efforts like student success analytics, crowding forecasts, and early detection models

## Required Qualifications:

- A Master's or PhD in Data Science, Computer Science, Biomedical Informatics, Statistics, Engineering, or related fields
- Experience in machine learning, natural language processing (NLP), or AI development
- Proficiency in Python, R, and data libraries (e.g., pandas, scikit-learn, TensorFlow/PyTorch)
- Familiarity with clinical, academic, or operational datasets (preferred)
- Strong communication skills to bridge the gap between technical outputs and real-world impact

To apply, email your CV, cover letter, and three references to [CAIRjobs@wakehealth.edu](mailto:CAIRjobs@wakehealth.edu) with "AI Analyst Application – AIMS Unit" as the subject line. 

# Recent Events

## ★ 2025 Summer Research Internship Program ★

The Wake Forest Center for Artificial Intelligence Research (CAIR), in partnership with the Wake Forest Department of Biomedical Engineering (BME), proudly wrapped up the 2025 Summer Research Internship Program with its annual Internship Symposium at the end of July. This capstone event brought together 39 interns – 17 from CAIR and 22 from BME – who spent 10 weeks over the summer immersed in hands-on scientific research.

The symposium served as an opportunity for interns to showcase their work across five themed sessions, highlighting diverse areas such as artificial intelligence in medicine, biomechanics, and simulation technologies. Each intern presented their findings to peers, faculty, mentors, and community members, sparking thoughtful discussion about the future of healthcare and technology.

Attendees selected winners by scanning QR codes and rating projects, making the symposium interactive and engaging. Congratulations to all award recipients and to every intern for their dedication, curiosity, and perseverance throughout the program.

We want to give a special shoutout to the following CAIR interns for placing in the top 3 of their presentation categories.

### Session #1: Artificial Intelligence & Machine Learning in Biomedical Applications

- **1st Place:** Ian Liu, “Harmonized Neuroimaging-Based Graph Neural Network to Improve Personalized Diagnosis for Alzheimer’s Disease”
- **2nd Place:** Ashlyn Melichar, “Ensemble Deep Learning for Tissue Segmentation in Breast Cancer Histopathology”
- **3rd Place:** Jillian Griffith, “AI-Enhanced Detection of Coronary Artery Calcium Levels Using ECG and Clinical Data”

### Session #5: Medical Devices & Simulation Technologies

**1st Place:** Bryan Ramillano, “Development of a Wireless Epidermal Skin Patch for Melanoma Detection”



2025 CAIR and BME Intern Cohort

Behind the scenes, the success of this summer experience would not have been possible without the commitment of our mentors, who provided invaluable guidance, expertise, and encouragement. Special recognition also goes to project managers Latrice Harris and Jaelyn Holmes from CAIR and Thea Smith from BME. Their thoughtful planning, organization, and leadership ensured a meaningful and impactful program for all participants. 🏆

# Recent Events

## ★ Second Annual Build-a-Thon Showcases Student Innovation ★

Graduate and undergraduate students grabbed their hard hats and joined the second annual Health Rewired Build-a-Thon, hosted by the Wake Forest University Center for Remote Health Monitoring and the Wake Forest Center for Artificial Intelligence Research. The event kicked off on September 17 with an opening session featuring presentations from Wake Forest School of Medicine researchers on topics such as remote sensing, clinical data analysis, and AI applications in healthcare. These presentations also introduced datasets that participants could use to inform and shape their projects.

Over the course of the following three weeks, three interdisciplinary teams of undergraduate and graduate students worked intensively to design remote health monitoring tools, develop artificial intelligence for clinical applications, and explore strategies for commercializing their innovations. With guidance from mentors and access to real-world data, students collaborated across disciplines to refine their ideas and build functional prototypes.

The Build-a-Thon concluded on October 8 with a final showcase event, where each team presented their work to a panel of medical professionals and researchers affiliated with the Wake Forest University School of Medicine. The judges evaluated the projects based on innovation, feasibility, and impact, and engaged each team in thoughtful Q&A sessions.

This event not only showcased the technical capabilities of the students but also emphasized the importance of interdisciplinary collaboration. Congratulations to all participants for their hard work and thoughtful contributions.

Thank you to everyone who made this event possible. We look forward to continuing this tradition of innovation and collaboration in next year's Build-a-Thon. 🏆

### Build-a-Thon Results

**First Place:** Team Ring-Tailed Bandits "Indri | Mindful Metrics - Re-Wiring Student Wellness Through Empathy & Innovation"  
*Logan Hammon, Victoria Little, Olivia Ontjes*

**Second Place:** Team Data Inspectors "DataLine: An Agentic AI for Clinical Data Analysis"  
*Alejandro Gonzalez Rubio, Suraj Prasai, and Saroj Bhatta*

**Third Place:** Team Mugsey "Fall Risk Kit"  
*David Wild and Joshua Ekoja*



Olivia Ontjes (left), Victoria Little (middle), and Logan Hammon (right)



Alejandro Gonzalez (left), Saroj Bhatta (middle), and Suraj Prasai (right)



Joshua Ekoja (left) and David Wild (right)

Thursday, July 24

**Presenter:**

Khalid Niazi, PhD  
The Ohio State University



**Title:** “Prognostic and Predictive Models in Pathology”

**Summary:** Dr. Niazi discussed the limitations of current foundation models in histopathology and emphasized the need for domain-specific approaches. The talk explored strategies for building robust, clinically relevant models and methods for evaluating them using clinical trial data.

[WATCH](#)

Thursday, August 7

**Presenter:**

Srijan Das, PhD  
UNC Charlotte



**Title:** “Two Tales of Vision Models for Health Monitoring: Generative and Interpretable Approaches”

**Summary:** Dr. Das presented computer vision tools for health monitoring, including models for activity recognition and interpretable pathology diagnostics. The talk emphasized bridging domain gaps and building trust in AI healthcare.

[WATCH](#)

Thursday, August 21

**Presenter:**

Da Ma, PhD  
Wake Forest University  
School of Medicine



**Title:** “AI-driven Integration of Neuroimaging Genomics for Alzheimer’s Disease and Biological Aging”

**Summary:** Dr. Ma presented AI models for early Alzheimer’s detection, dementia prediction, and disease progression using neuroimaging and genomics. His work supports more precise and interpretable diagnostics.

[WATCH](#)

Thursday, September 11

**Presenters:**

Brian Wells, MD, PhD &  
Andrew McWilliams, MD  
Wake Forest University School of Medicine



**Title:** “A Practical Framework for Appropriate Implementation and Review of Artificial Intelligence (FAIR-AI) in Healthcare”

**Summary:** Dr. Wells and Dr. McWilliams shared an overview of the FAIR-AI framework, designed to help health systems responsibly evaluate and monitor AI tools by balancing innovation with safety and ethical considerations

[WATCH](#)