

# CAIR QUARTERLY

## DIRECTOR'S NOTE

*From Dr. Metin Gurcan*

Dear CAIR member,

I am thrilled to share with you the latest updates from the **Center for Artificial Intelligence Research at Wake Forest University School of Medicine**. Since our establishment on Oct. 1, 2023, we have been actively working toward fostering collaboration and advancing the application of AI in healthcare.

CAIR has seen impressive growth in its membership, now surpassing **250 members**. This diverse community includes a vibrant student chapter, the Future of Artificial Intelligence Research (FAIR), which plays a crucial role in fostering early engagement with AI research among students.

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## Director's Note

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The expansion of CAIR underscores its pivotal role in advancing AI applications in healthcare, drawing significant interest from across academic levels and external affiliations.

One of our primary goals is to provide opportunities for learning and networking with leading experts in the field of AI. To achieve this, we have organized the **Artificial Intelligence in Action** seminar series, where we invite renowned AI experts from around the world to share their work and experiences. These seminars have been incredibly insightful and have given us all a deeper understanding of the potential of AI in healthcare.

In addition to the seminar series, we have also organized various workshops and colloquia. One event that stands out is the **Center for Artificial Intelligence Research Colloquium**, where we focused on exploring the benefits, risks, and responsibilities of predictive analytics in healthcare. The discussions and insights from this colloquium were truly enlightening and opened up new avenues for further exploration in our research.

Furthermore, we had the privilege of organizing a **Workshop on AI** and healthcare, featuring a keynote talk by Dr. Susan Gregurick, Associate Director for Data Science and Director of the Office of Data Science Strategy (ODSS) at the National Institutes of Health (NIH). The workshop covered a range of topics, including the use of AI algorithms in health applications, emerging AI technologies for healthcare, equitable AI, and advances in AI for healthcare and drug discovery. The knowledge shared by our esteemed speakers has provided us with valuable insights and allowed us to progress in our efforts to integrate AI into healthcare practices.



**Dr. Metin Gurcan**

Our faculty members have also been actively involved in advancing AI research and have received several AI-related grants. Their hard work has resulted in the publication of exciting papers, which are [\*\*featured here on pages 21 through 28\*\*](#). We are proud of their achievements and know that their contributions will significantly impact the field of AI and healthcare.

**Dr. Arezoo Movaghar** recently joined the Wake Forest University School of Medicine as an Assistant Professor in the Pediatrics department and at the Center for Artificial Intelligence Research. Holding a PhD in biomedical informatics from the University of Wisconsin-Madison, Dr. Movaghar's research primarily focuses on developing advanced AI frameworks to enhance diagnostic and prognostic processes in complex disorders.

In recent months, our faculty have continued to make significant strides in AI research, with notable achievements including **Dr. Meredith Adams** receiving the NIH Research Award and **Dr. Mostafa Rezapour**'s research being featured by Wiley. (See page 4 for more info.) These accolades not only enhance our reputation but also underscore our commitment to cutting-edge research in AI-driven healthcare. (*Continued on next page*)

# Director's Note

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We are excited to announce the availability of the **New England Journal of Medicine AI** journal through the WFSOM Library, a valuable resource for our community. Additionally, our recent and upcoming events, such as the AI in Healthcare Workshop and the AI-IA Seminar Series, provide robust platforms for collaboration and learning from global experts in AI and medicine.

Looking ahead, we have a lot planned for the coming months and years. Our center will continue to organize workshops, seminars, and grand round talks to foster learning and collaboration. We believe that staying up to date with the latest developments in AI is crucial for driving innovation and making a positive impact in healthcare.

To keep track of our activities, I encourage you to read our quarterly newsletter and follow us on social media (@WakeForestAI). We aim to provide timely updates, insightful articles, and thought-provoking discussions that will deepen your understanding of AI in healthcare.

Thank you for your support and enthusiasm for the Center for Artificial Intelligence Research. As we continue to expand our research and educational offerings, I encourage each of you to engage with these opportunities, participate in our events, and contribute to our growing body of research. Your active involvement is crucial to our collective success in advancing the frontiers of AI in medicine. Together, we will continue to drive innovation and create a brighter future for healthcare.

Finally, I want to emphasize that we value your input and feedback. We are here to serve our community, and your thoughts and ideas will help us shape our future activities. Please feel free to contact us at **cair@wakehealth.edu** with any suggestions or comments.

Sincerely,

Dr. Metin Gurcan  
Director, Center for Artificial Intelligence Research

## ALSO INSIDE

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[Da Ma](#)

[Khalid Niazi](#)

Mark your calendars!

CAIR's next AI-IA seminar is just around the corner.

[Click here to register.](#)

 WAKE FOREST CAIR EVENT ANNOUNCEMENT

TUESDAY, MAY 14  
1:30 – 2:30 P.M.  
HYBRID

**ARTIFICIAL  
INTELLIGENCE  
IN ACTION**

Keynote Speaker | 2024 Health Educator Conference  
**“How AI Can Transform Medical Education”**  
Jointly sponsored by CAIR and the Health Professions Education Institute

JOIN US:  
WEBEX & WAKE FOREST BIOTECH PLACE  
575 N. PATTERSON AVE, WINSTON-SALEM, NC

FOR MORE INFORMATION, CONTACT:  
[CAIR@WAKEHEALTH.EDU](mailto:CAIR@WAKEHEALTH.EDU)  
LEARN MORE ABOUT CAIR AT:  
[SCHOOL.WAKEHEALTH.EDU/CAIR](http://SCHOOL.WAKEHEALTH.EDU/CAIR)



# Dr. Meredith Adams to Receive NIH Research Award

**Meredith C.B. Adams, MD, MS**, an associate professor in the Department of Anesthesiology of the Wake Forest School of Medicine and CAIR faculty member, is slated to receive the prestigious **2024 Rising Star Pain Research Award** at the upcoming May NIH HEAL Initiative PURPOSE Meeting, hosted by The Pain Research Network.

This distinguished award is designed to recognize early-career researchers who demonstrate exceptional potential and innovation in the field of pain research.

Dr. Adams' innovative portfolio of pain research is in alignment with the NIH HEAL goals to enhance chronic pain care and mitigate opioid misuse and abuse, supported by a substantial \$8,483,492 in research funding. Additionally, she has showcased a robust track record of research contributions through her publications, presentations, and scholarly activities, further solidifying her impact on the field of pain research.



**Dr. Meredith Adams**

This latest honor for Dr. Adams follows the Helping to End Addiction Long-Term (HEAL) Director's Trailblazer Award she received from the NIH in 2023.

That award recognizes HEAL-funded researchers in the early to middle stages of their careers who are applying an innovative approach or creativity in their research, or are expanding research into addressing the pain and opioid crisis.

The NIH, part of the U.S. Department of Health and Human Services, is the nation's medical research agency and includes 27 institutes and centers. It is the primary federal agency conducting and supporting basic, clinical, and translational medical research, and is investigating the causes, treatments, and cures for both common and rare diseases.

For a list of Dr. Adams' recent publications and achievements, [click here](#). 

# Dr. Mostafa Rezapour's Research Highlighted by Wiley

Can Artificial Intelligence help treat patients with bone fractures?

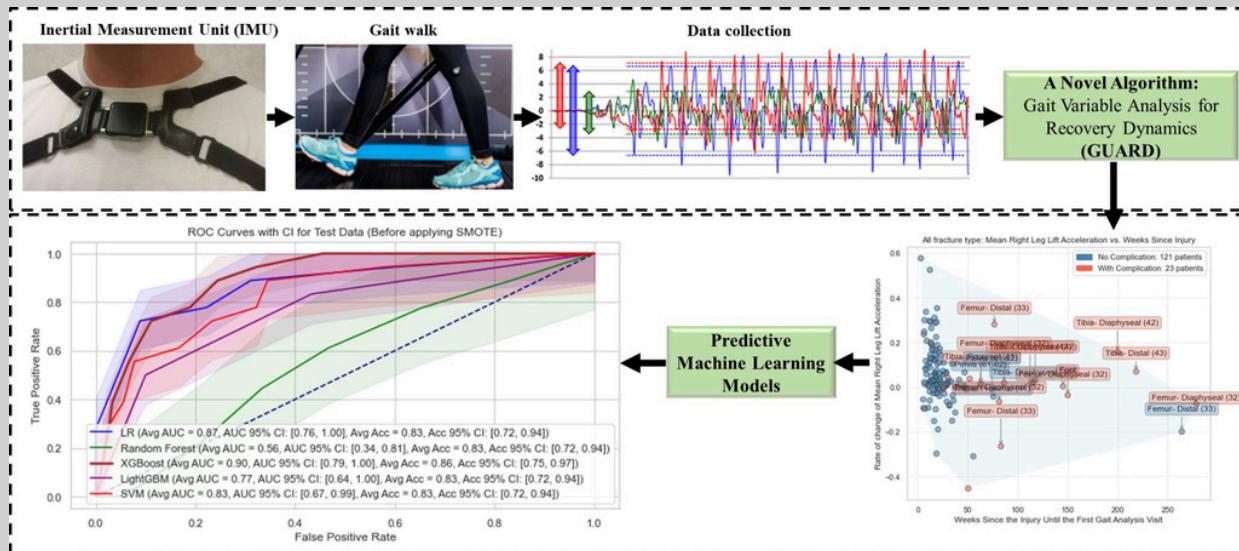
This is the question that **Dr. Mostafa Rezapour**, a research fellow at Wake Forest CAIR, is exploring. His research team applied AI techniques to gait analyses and medical records data to provide insights about individuals with leg fractures and aspects of their recovery, and their work is now [highlighted by academic publisher Wiley](#).

Specifically, Dr. Rezapour's study examined the potential of gait analysis coupled with supervised machine learning models as a predictive tool for assessing post-injury complications such as infection, malunion, or hardware irritation among individuals with lower extremity fractures.

"Our findings demonstrate the profound impact that integrating machine learning and gait analysis into orthopedic practice can have, not only in improving the accuracy of post-injury complication predictions but also in tailoring rehabilitation strategies to individual patient needs," said Rezapour. "This approach represents a pivotal shift toward more personalized, predictive, and ultimately more effective orthopedic care."



**Dr. Mostafa  
Rezapour**



To view the abstract and full study, [click here](#).

# CAIR Grants Pilot Award to Researchers Studying Sleep Problems in Cancer Patients

Wake Forest CAIR has awarded project funding to two researchers who are studying sleep difficulties in cancer patients and how those difficulties may impact treatment outcomes.

**Sarah N. Price, PhD** and **Kathryn Weaver, PhD** of the Wake Forest School of Medicine received a pilot award from CAIR in the amount of \$3,000. They are collaborating with a team at Atrium Health Levine Cancer Institute (LCI) in Charlotte, NC that includes Dr. Sarah Galloway, Dr. Dori Beeler, Dr. Aynur Aktas, Dr. Arunkumar Krishnan, Dr. Wei Sha, Hang (Laurel) Zang, and Dr. Declan Walsh.

According to the researchers, sleep problems are among the most common and burdensome issues experienced by cancer survivors. Despite the significance of sleep problems in the context of cancer care, few cancer centers routinely screen and treat this concern.

LCI has inquired about sleep difficulties as part of its electronic distress screening (EDS) since 2017, offering a unique opportunity to integrate EDS and EHR data to explore the prevalence and correlates of sleep difficulties in a large and diverse population of cancer patients treated in a real-world setting.



**Dr. Sarah N. Price**



**Dr. Kathryn Weaver**

With support from CAIR, the team led by Drs. Price and Weaver will determine the prevalence of sleep difficulties among patients with cancer screened at LCI, identify patients at highest risk for sleep difficulties, and examine associations between patient-reported sleep difficulties and treatment outcomes (e.g., hospitalizations, survival).

Investigating the correlates of patient-reported sleep difficulties will inform future efforts to screen and treat patients by identifying subgroups of patients at elevated risk, elucidating patterning of sleep difficulties with other cancer-related concerns, and determining clinics where greater resources are needed. 

# CAIR Grants Bonus Funding to Recipients of CTSI Pilot Award

Wake Forest CAIR has awarded \$10,000 in supplemental funding to each of two recipients of a 2024 Wake Forest Clinical and Translational Science Institute (CTSI) Pilot Award.

The \$10,000 bonuses were awarded to **Ashish Kumar Khanna, MD, FCCP, FCCM** and **Dr. Rohan Mahabaleshwarkar, MD**, both of whom are slated to begin their research projects on July 1.

Dr. Khanna is an associate professor in the Department of Anesthesiology at the Wake Forest School of Medicine. His project is titled “Precision-Based Renin Assessment in Septic Shock Outcomes.”

The project proposes more precise and complete measures of renin and other RAAS components that may be better predictors of septic shock severity. Planned across Atrium Health sites in North Carolina, this collaborative work will improve staging and clinical precision and will facilitate the criteria for therapeutic development of targets in septic shock, Dr. Khanna says.

Dr. Mahabaleshwarkar is an adjunct assistant professor in the Department of Implementation Science at the Wake Forest School of Medicine.



**Dr. Ashish Kumar Khanna**



**Dr. Rohan Mahabaleshwarkar**

His project is titled, “Validation of a Pharmacy Risk Score in Patients with Diabetes and Hypertension.”

This pivotal validation study aims to assess the effectiveness of the pharmacy risk score in predicting critical outcomes such as uncontrolled diabetes and hypertension, as well as emergency room visits and medication-related issues. Conducting a retrospective cohort study utilizing electronic medical records data from October 2021 to December 2023, the project will employ the Area Under the Curve index to evaluate the predictive capabilities of the score. The research not only promises to refine the allocation of clinical pharmacists but also marks an essential step toward developing a cost-effective process for chronic disease care. 

## CAIR Awards Funding to Researchers Aiming to Boost Clinical Trial Recruitment with EHR Data

Wake Forest CAIR has granted \$1,000 to two researchers who are embarking on a project that aims to transform clinical trial participant identification and recruitment within the Department of Orthopaedic Surgery and Rehabilitation at the Wake Forest School of Medicine.

The project is spearheaded by **Dr. Mike Jones**, an assistant professor of Orthopaedic Surgery at WFSOM, and **Martha Holden**, manager of clinical research in the Department of Orthopaedic Surgery and Rehabilitation.

Their goal is to assess the effectiveness of EHR data tools and secure electronic communication in clinical trial recruitment, exploring their potential for expanding participant reach, boosting recruitment rates, and enhancing engagement. The researchers also seek to understand participants' communication preferences to refine future recruitment strategies.

Dr. Jones and Holden will use advanced EHR data tools like i2b2 and Translational Data Warehouse, alongside HIPAA-compliant communication, with the dual objective of streamlining recruitment and improving participation rates for ongoing clinical investigations.



**Dr. Mike Jones**



**Martha Holden**

Additional goals include optimizing clinical trial recruitment by reducing resource burdens, improving efficiency, and refining patient-centered recruitment strategies via access of innovative EHR data tools and secure communication channels.

These advancements, the researchers say, would demonstrate the potential for data-driven approaches to revolutionize clinical research recruitment within the Department of Orthopaedic Surgery and Rehabilitation at Atrium Health Wake Forest Baptist Health. 



## Faculty Spotlight: Dr. Arezoo Movaghar

# CAIR's Newest Faculty Member Looks to Tackle Health Disparities Through AI Medical Research

**A**rezoo Movaghar, PhD joined the Wake Forest University School of Medicine in 2023 with a joint appointment as an Assistant Professor in the Department of Pediatrics and at the Center for Artificial Intelligence Research.

Dr. Movaghar received her BSc and MSc in computer engineering with special focus on AI. She completed her doctoral and postdoctoral training in biomedical informatics at the University of Wisconsin-Madison.

Her research is focused on developing innovative and accessible diagnosis and prognosis frameworks for complex disorders. She utilizes AI techniques, population-level electronic health records, and longitudinal biopsychosocial data to characterize the clinical risk associated with different conditions. She has also developed AI-assisted pre-screening frameworks to accelerate the diagnostic process for multiple genetic disorders.



**Dr. Arezoo  
Movaghar**

### Interest in AI

The most interesting part of using AI in medical research, Dr. Movaghar says, is the ability to discover new information hidden in data that sometimes has been available for years but has never been identified.

“

“The profound impact of these discoveries on patients, their families and society are breathtaking, and the opportunities that AI is offering to improve health, well-being and quality of life in patients are endless,” she says. “Another important aspect of using AI and EHR data is the possibility of including a large cohort of patients in research without posing any burden and barriers of participation to patients.”

## Contributing to CAIR

Dr. Movaghar says she was drawn to CAIR and its network of outstanding researchers who are committed to developing advanced and accessible technologies to improving patients' health and safety.



"CAIR is providing amazing opportunities for close collaboration with clinicians, policymakers, and patients' communities. It also offers access to large, diverse datasets and high-throughput computational resources that facilitate and support research activities," she says.

Dr. Movaghar says she hopes to contribute toward the creation of comprehensive EHR-informed biobanks for complex genetic disorders. She is also developing AI models that will decrease diagnostic disparities and works on identification of factors related to health disparities in patients.

## Latest Research & Upcoming Projects

Dr. Movaghar is the principal investigator of an NIH-funded R03 grant and MPI on an R01 grant, both of which investigate patterns of health care utilization in patients with fragile X syndrome, the most common inherited cause of intellectual disability and autism.

The R03 is focused on examination of health inequities and diagnostic disparities in fragile X syndrome using a racially and ethnically diverse population cohort. The R01 is the largest study of adults with fragile X syndrome, examining the potential social and environmental factors impacting patients' health and functional outcomes.

She is also working on several projects focused on health disparities in patients with disabilities. She is using EHR data to examine the clinical risk associated with different neurological disorders and identification of disease subtypes.

As part of a multi-institutional collaboration, Dr. Movaghar and her colleagues are investigating Bell's palsy, the potential causes, and possible long-term impacts of this condition on health. They are currently collecting preliminary data for a potential grant. She is also preparing an NIH proposal focused on autism spectrum disorders using data from multiple healthcare systems across the country. 

## Wake Forest Law School Seeking Speakers for AI in Healthcare Panel

With the support of CAIR, the Wake Forest School of Law and Wake Forest Journal of Law and Policy are holding a symposium on Oct. 25, 2024, titled, “The Legal Implications of Artificial Intelligence in Healthcare.”

The symposium's goal is collaboration between the legal and medical community and the publication of scholarly research and opinions. The event draws about 200 professionals each year.

To provide a successful learning experience, the law school is seeking:



- Speakers to share insight on panels. Topics include AI today, the future of AI, ethics, confidentiality, medical malpractice, and more.
- Articles to publish in the Symposium Journal Edition
- Medical community members willing to collaborate on scholarly articles with law students

If you are interested in participating in the symposium, please contact Brittany Taylor at [taylrbm22@wfu.edu](mailto:taylrbm22@wfu.edu) and Amelia Schulte at [schuag18@wfu.edu](mailto:schuag18@wfu.edu). 

## NEJM AI Journal Is Now Available Through WFSOM Library

Access to the **New England Journal of Medicine AI** is now available through the Wake Forest School of Medicine library.

NEJM AI is a monthly, online-only journal that covers and evaluates applications of artificial intelligence in medicine. Its first issue was released in January.

Per NEJM's website:

"NEJM AI intentionally pairs "pre-clinical" and clinical articles to deliver critical context to both clinicians and non-clinician researchers. The journal bridges the fast-moving developments in AI, informatics, and technology in medicine with the application of these advancements to clinical practice.



"NEJM AI covers the application of AI methodologies and data science to biomedical informatics, connected health, telemedicine, medical images and imaging, personalized medicine, policy and regulation, and the ethical and medicolegal implications of AI."

To access the journal through Wake Forest Libraries, [click here](#). 

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

**As part of CAIR's ongoing efforts to highlight and support the diverse and innovative 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 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 that your project is included in this inventory and to foster collaboration and awareness within our community, we kindly ask you to complete [this questionnaire](#). The questionnaire 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.** 

# Recent Events

The Wake Forest Center for Artificial Intelligence Research has held various events since its inception in October 2023. Here's a summary:

## 2023 Fall Colloquium

### **Theme: “Navigating the Benefits, Risks, and Responsibilities of Predictive Analytics in Healthcare”**

CAIR's inaugural Fall Colloquium, held at the Bowman Grey Center for Medical Education, drew 80 attendees. It featured 30 poster presentations, and two presenters received travel awards.



## Clinical Informatics Short Course: AI & Healthcare

Held at Wake Forest Biotech Place last fall, this day-long workshop featured six speakers and drew 85 attendees. CAIR was awarded a grant by the North Carolina Biotechnology Center as part of the co-hosted event.

Presentation videos can be found on CAIR's YouTube channel, [@WakeForestAI](#). Subscribe to our channel to be notified when new videos are uploaded.



# Recent Events



## Faculty Retreat

CAIR's first faculty retreat, held last fall at The Historic Brookstown Inn in Winston-Salem, was a success, leading to collaborative work, funding opportunities, and much more.

## December 2023 Celebration

A social function was held at Wake Forest Biotech Place to celebrate the launch of CAIR and reflect on WFBMI's achievements. Event activities included games, gingerbread house-building competitions, and networking.

CAIR looks forward to celebrating its one-year anniversary this December.



## Connect Session



CAIR's first virtual Connect Session was held April 2, 2024, in conjunction with The Institute for Experiential AI (EAI) at Northeastern University.

Attendees, which included researchers from Wake Forest/Advocate Health and EAI, reported positive experiences as participants in the 1.5-hour networking event, which encouraged the formation of collaborative teams with an eye toward applying for a \$50,000 pilot award.

# Recent Events

## FAIR Meet and Greet

The Future of Artificial Intelligence Research (FAIR) is the newly established student chapter of the Wake Forest Center for Artificial Intelligence Research. On March 28, 2024, FAIR visited CAIR's home office at the Bailey Power Plant in Winston-Salem, NC to meet with CAIR faculty and staff, discuss opportunities for collaboration, and enjoy refreshments.

CAIR's director, Dr. Metin Gurcan, spoke with students and led discussions of how the center could best support FAIR and the ideas being proposed by its student members.

Moving forward, the CAIR team will hold quarterly meetings with FAIR. Additionally, CAIR will organize a special student forum for students to present at the AI at Advocate Symposium, to be held June 28th.



CAIR looks forward to working with FAIR, fostering its growth, and encouraging more young people to explore opportunities for impacting healthcare with AI.



## PROFESSIONAL DEVELOPMENT & COLLABORATION

### 2024 Artificial Intelligence in Action Seminar Series

Wake Forest CAIR holds monthly Artificial Intelligence in Action seminars featuring speakers who share their expertise on AI applications in healthcare. Here is a rundown of the AI-IA events held in 2024 thus far:

**Wednesday, Jan. 17**

**Presenter: Wendy Chapman, PhD**

Associate Dean of Digital Health and Informatics

Director of the Centre for Digital Transformation of Health

The University of Melbourne



**Title: “Connecting AI (and Other Digital Innovations) to Healthcare: the Role of an Academic Learning Health System”**

**Summary:** Thousands of AI algorithms and healthcare apps, Dr. Chapman says, are developed but never implemented. In her presentation, she discussed how the Academic Learning Health System (aLHS) offers a framework to improve our ability to translate new innovations into healthcare systems. She also shared what she has learned about how to operationalize an aLHS and pointed to ideas for accelerating the implementation and adoption of AI and other innovations.

**Thursday, Feb. 29**

**Presenter: Daniel W. Byrne**

Artificial Intelligence in Medicine Consultant

Byrne Research



**Title: “Artificial Intelligence for Improved Patient Outcomes - the Pragmatic Randomized Controlled Trial Is the Secret Sauce”**

**Summary:** Most thought leaders believe that AI offers tremendous potential for benefiting healthcare, yet there is still almost no rigorous evidence that it improves patient health outcomes, Byrne says. In his presentation, he explored why there is a dearth of evidence and what needs to change. He also explained that by using pragmatic randomized controlled trials to know when AI has moved the needle regarding outcomes, healthcare can move faster into a modern era of AI that benefits both patients and clinicians.

## PROFESSIONAL DEVELOPMENT & COLLABORATION

### 2024 Artificial Intelligence in Action Seminar Series

**Tuesday, March 12**

**Presenter: Jonathan H. Chen, MD, PhD**

Assistant Professor – Medical Center Line  
Center for Biomedical Informatics Research  
Stanford Department of Medicine



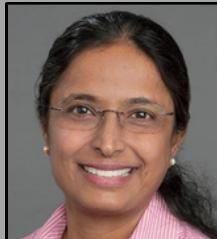
**Title: “Artificial Intelligence in Medicine – Real Magic or Technological Illusions?”**

**Summary:** With a global scarcity of medical expertise against the unlimited demand of people in need, AI's potential to democratize healthcare knowledge and recover efficiencies is desperately needed, Dr. Chen says. His presentation examined opportunities and pitfalls in the context of specific projects around user-studies of physician and AI decision-making, integration of chart summarization workflows, and personalized clinical decision support through data-driven prediction and recommender algorithms. He also reviewed the attention and intention required for AI applications in the high-stakes world of healthcare.

**Thursday, April 4**

**Presenter: Savithri Nageswaran, MD, MPH**

Professor, Pediatrics  
Professor, Social Sciences and Health Policy  
Professor, Implementation Science  
Wake Forest University School of Medicine



**Title: “Who Are Children with Medical Complexity and How Can We Use AI to Improve Their Healthcare?”**

**Summary:** Dr. Nageswaran provides medical care for children with medical complexity (CMC), who account for about 1% of all children and have very high needs for health and support services. The continuing – and largely unmet – need for complex medical care places a profound burden on parents/caregivers of these children, she says. Her presentation summarized the barriers to the healthcare delivery of CMC and explored how AI can be used in studies to improve it.

# Upcoming Events

**Tuesday, May 14**

**1:30 p.m. – 2:30 p.m. EDT**

**WHAT:** "How AI Can Transform Medical Education"

Keynote presentation at the 2024 Health Educator Conference



**WHO:** Verity E. Schaye, MD, MHPE; New York University Grossman School of Medicine

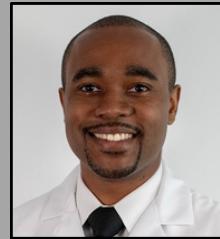
**WHERE:** Wake Forest Biotech Place, Atrium (575 N. Patterson Ave., Winston-Salem, NC) / WebEx

**Tuesday, May 14**

**4:00 p.m. - 5:30 p.m. EDT**

**WHAT:** WFSOM Spring Quarterly Meeting:

"Artificial Intelligence and the Future of Dermatology"



**WHO:** Adewole "Ade" Adamson, MD, MPP; The University of Texas at Austin

**WHERE:** Dermatology Clinic, 2nd Floor, Large Conference Room (4618 Country Club Rd., Winston-Salem, NC 27104) / WebEx

**Wednesday, May 15**

**12:00 p.m. – 1:00 p.m. EDT**

**WHAT:** AI in Action Seminar:

"Patent Law 101: Basics of the Law with a Focus on AI"



**WHO:** W. Keith Robinson, JD and Raina Raque, JD; Wake Forest School of Law

**WHERE:** Bailey Power Plant, Room 421 (486 N. Patterson Ave., Winston-Salem, NC) / WebEx

# Upcoming Events

**Tuesday, May 28**

## **First Day of CALIBIR Summer Internship Program**

Led by CAIR and Biomedical Engineering faculty, this 10-week summer research internship program for undergraduate and master's-level students will include 36 student interns.

The program is supported by the National Institutes of Health R25 Grant, "Culturally Augmented Learning in Biomedical Informatics Research (CALIBIR)." We provide research opportunities to all students, focusing on students from underserved communities and those attending colleges with limited STEM research opportunities.

Students participate in seminars, training modules, research laboratories, and workshops at Wake Forest. They also take part in journal clubs, boot camps, alumni panel events, a Diversity Networking Reception, and an Internship Program Symposium where the students present their project work.

**Friday, June 7**

**12:00 p.m. – 1:00 p.m. EDT**

**WHAT:** AI in Action Seminar:

"Exploring Basic Principles and Advanced Applications of Machine Learning in Medicine, with a Focus on Osteoarthritis"



**WHO:** Dr. Neslihan Yalcin Bayramoglu, PhD; University of Oulu

**WHERE:** WebEx

# Upcoming Events

**Friday, June 28**

**8:30 a.m. - 1:00 p.m. EDT**

**WHAT:** AI in Healthcare Workshop:  
“Transforming Medicine for a Better Future”



**WHO:** Susan Gregurick, PhD, Director of the Office of Data Science Strategy, at the National Institutes of Health, will deliver a keynote presentation for CAIR's annual AI in Healthcare Workshop. Her address will be followed by eight presentations delving into various aspects of AI research in medicine.

**PLUS:** CAIR is excited to announce two special awards at this event: the [Early-Stage Investigator Award](#) and the [Trainee Award](#). We welcome applicants to submit more than one abstract.

**Due date of abstract:** Friday, May 24, 2024. To submit your abstract, [click here](#).

**Registration deadline:** Friday, June 7, 2024. To register for the workshop, [click here](#).

**WHERE:** Wake Forest Biotech Place, 151 Auditorium  
(575 N. Patterson Ave., Winston-Salem, NC)

**Tuesday, July 9**

**12:00 p.m. - 1:00 p.m. EDT**

**WHAT:** AI in Action Seminar



**WHO:** Ulas Bagci, PhD

Associate Professor, Radiology at Northwestern University

**WHERE:** WebEx

## FACULTY PUBLICATIONS & ACHIEVEMENTS

# Metin Gurcan, PhD

**Director, Center for Artificial Intelligence Research  
Senior Associate Dean, Artificial Intelligence  
Professor, General Internal Medicine  
Professor, Wake Forest Institute for Regenerative Medicine**



## Publications

Tavolara TE, Niazi MKK, Feldman AL, Jaye DL, Flowers C, Cooper LAD, Gurcan MN, "Translating prognostic quantification of c-MYC and BCL2 from tissue microarrays to whole slide images in diffuse large B-cell lymphoma using deep learning," *Diagn Pathol*. 2024 Jan 19;19(1):17. doi: 10.1186/s13000-023-01425-6. PMID: 38243330; PMCID: PMC10797911.

Ma D, Stocks JK, Lockhart SN, Craft S, Rosen HJ, Gurcan MN, Popuri K, Beg MF, Wang L, "Differentiation of frontotemporal dementia subtypes using neuroimaging-based multi-type parallel feature embedding," *Alzheimer's & Dementia*, 2023 Dec;19:e079847.

Ma D, Stocks J, Craft S, Gurcan MN, Wang L, "Differential diagnosis of frontotemporal dementia subtypes with explainable deep learning on structural MRI," *Frontiers in Neuroscience*, vol. 18, 2024 Feb 7;18:1331677.

Camalan S, Niazi MK, Elmaraghy C, Moberly AC, Gurcan MN, "Tympanic membrane segmentation of video frames to create composite images using SAM," *SPIE Medical Imaging 2024: Computer-Aided Diagnosis* 2024 Apr 3 (Vol. 12927, pp. 766-773), San Diego, CA.

Su Z, Chen W, Leigh PJ, Sajjad U, Niu S, Rezapour M, Frankel WL, Gurcan MN, Niazi MK, "Few-shot tumor bud segmentation using generative model in colorectal carcinoma," *SPIE Medical Imaging 2024: Digital and Computational Pathology* 2024 Apr 3 (Vol. 12933, pp. 51-57), San Diego, CA.

Su Z, Tavolara TE, Sajjad U, Gurcan MN, Segal S, Niazi MK, "Combining frontal and profile view facial images to predict difficult-to-intubate patients using AI," *SPIE Medical Imaging 2024: Computer-Aided Diagnosis* 2024 Apr 3 (Vol. 12927, pp. 125-131), San Diego, CA.

Sajjad U, Chen W, Rezapour M, Su Z, Tavolara T, Frankel WL, Gurcan MN, Niazi MK, "Enhancing colorectal cancer tumor bud detection using deep learning from routine H&E-stained slides," *SPIE Medical Imaging 2024: Digital and Computational Pathology* 2024 Apr 3 (Vol. 12933, pp. 199-205), San Diego, CA.

Su Z, Rosen A, Wesolowski R, Tozbikian G, Niazi MK, Gurcan MN, "Deep-ODX: an efficient deep learning tool to risk stratify breast cancer patients from histopathology images," *SPIE Medical Imaging 2024: Digital and Computational Pathology* 2024 Apr 3 (Vol. 12933, pp. 34-39), San Diego, CA.

Su Z, Chen W, Annem S, Sajjad U, Rezapour M, Frankel WL, Gurcan MN, Niazi MK, "Adapting SAM to histopathology images for tumor bud segmentation in colorectal cancer," *SPIE Medical Imaging 2024: Digital and Computational Pathology* 2024 Apr 3 (Vol. 12933, pp. 64-69), San Diego, CA.

## Accomplishments

### **Grand Rounds Talks:**

"Harnessing the Potential of Artificial Intelligence for Improved Orthopaedics: Current Trends and Future Directions," Wake Forest University School of Medicine Department of Orthopaedic Surgery and Rehabilitation Grand Rounds, Winston Salem, NC, January 17, 2024.

"Harnessing the Potential of Artificial Intelligence for Pediatrics: Current Trends and Future Directions," Wake Forest University School of Medicine Department of Pediatrics Grand Rounds, Winston Salem, NC, March 8, 2024.

## FACULTY PUBLICATIONS & ACHIEVEMENTS

# Meredith Adams, MD, MS

Associate Professor, Anesthesiology  
Associate Professor, Public Health Sciences



## Publications

### Peer-Reviewed Publications:

Adams MCB, Hurley RW, Topaloglu U. **Connecting Chronic Pain and Opioid Use Disorder Clinical Trials Through Data Harmonization: Wake Forest IMPOWR Dissemination, Education, and Coordination Center (IDEA-CC)**. Subst Use Addctn J. 2024 Mar 22:29767342241236287. doi: 10.1177/29767342241236287. Epub ahead of print. PMID: 38516882.

Adams MCB, Wandner LD, Kolber BJ. **Challenges and opportunities for growing and retaining a pain research workforce**. Pain Med. 2024 Mar 8:pnae008. doi: 10.1093/pmt/pnae008. Epub ahead of print. PMID: 38459612.

Boyd T, Chibueze J, Pester BD, Saini R, Bar N, Edwards RR, Adams MCB, Silver JK, Meints SM, Burton-Murray H. **Age, Race, Ethnicity, and Sex of Participants in Clinical Trials Focused on Chronic Pain**. J Pain. 2024 Mar 16:104511. doi: 10.1016/j.jpain.2024.03.007. Epub ahead of print. PMID: 38492711.

## Accomplishments

### New Grant Awards:

Title: **The Opioid Cohort Consortium (OPICO) to investigate the effects of using opioids on cancer risk**

Role: Co-I; Dates: 4/01/2024 - 3/31/2029; \$2,808,898

### Pending Awards:

Title: **Developing a Diverse Workforce: Advancing Data Science for Addiction Research and Professional Training (ADAPT)**

Role: PI; Dates: 09/01/2024-08/31/2027; \$405,980

### Presentations at Professional Meetings:

**“Developing a Common Data Measure for Chronic Pain and OUD” 2024**  
NIH IMPOWR Network Bethesda, MD

**“Developing Your Research Portfolio” 2024**  
PROWD Mentoring Meeting Orlando, FL

## FACULTY PUBLICATIONS & ACHIEVEMENTS

# Oguz Akbilgic, PhD

Associate Professor, Internal Medicine,  
Cardiovascular Medicine



## Publications

**“Development and Validation of an Electrocardiographic Artificial Intelligence Model for Detection of Peripartum Cardiomyopathy.”** American Journal of Obstetrics & Gynecology MFM, 2024, 6(4), 101337

**“AI-Based Preeclampsia Detection and Prediction with Electrocardiogram Data.”** Front. Cardiovasc. Med. Sec. Cardiovascular Epidemiology and Prevention

**“AI-Enabled ECG for Paroxysmal Atrial Fibrillation Detection: One Step to Closer to the Finish Line.”** JACC Clinical Electrophysiology

**“A Generalizable ECG-based Artificial Intelligence Model for 10-Year Heart Failure Risk Prediction.”** Cardiovascular Digital Health

## Accomplishments

### **Presentations:**

Two invited talks at AI4Health: Improving Health through Artificial Intelligence Conference, April 22-25, Orlando, Florida.

**“Smart Watches with ECG Functionality and Opportunities for Remote Disease Diagnosis: ECG-AI”**

**“The Journey of AI from Computer to Clinical Workflow”**

Presented at The Accelerating Medicine Partnership (AMP) Symposium, February 5-6, 2024, Bethesda, MD.

**“ECG-AI-based Classification of Heart Failure Subtypes”**

# Ajay Dharod, MD

Associate Professor, General Internal Medicine

Associate Professor, Implementation Science



## Publications

### **Peer-Reviewed Publications:**

Birken SA, Matulewicz R, Pathak R, Wagi CR, Peluso AG, Bundy R, Witek L, Krol B, Parchman ML, Nielsen M, Dharod A. **"Toward the Deimplementation of Computed Tomography Urogram for Patients With Low-to Intermediate-risk Microscopic Hematuria: A Mixed-method Study of Factors Influencing Continued Use."** Urology Practice. 2023 Sep;10(5):511-9.

### **Manuscripts Under Review or In Preparation:**

Bundy R, Moses AW, Stambaugh E, Stewart WP, Witek L, Carlasare L, Rosenthal G, Sinsky C, Dharod A. **"Exploring physician time in the EHR Inbasket and tools aimed at optimizing Inbasket efficiency."** Journal of General Internal Medicine (JGIM). Accepted with revisions.

Xiao T, Witek L, Bundy RA, Moses AW, Obermiller C, Dharod A, Russo M, Rudnick S. **"Identifying patients at risk for metabolic dysfunction-associated steatotic liver disease (MASLD) with advanced fibrosis and the linkage to care."** American Journal of Gastroenterology. Under Review.

## Accomplishments

### **Presentations at Professional Meetings:**

Poster: Jones B, Quinn M, Garcia JM, Refugio Aviles L, Russell L, Isom S, Sucaldito AD, Alonso J, Mann-Jackson L, Wright E, Dharod A, Palakshappa D, Tanner A, Rhodes SD, Morse CG. **"Food insecurity, pre-diabetes, and diabetes in a cohort of adults with HIV residing in central and western North Carolina."** Wake Forest School of Medicine Student Research Day, Winston-Salem, NC, 11 October 2023, poster #2.

Poster: Quinn M, Jones B, Garcia JM, Refugio Aviles L, Russell L, Isom S, Sucaldito AD, Alonso J, Mann-Jackson L, Wright E, Dharod A, Palakshappa D, Tanner A, Rhodes SD, Morse CG. **"Prevalence and Distribution of Food Insecurity in Persons with HIV Followed in the Atrium Health Wake Forest Baptist Infectious Disease Specialty Clinic."** Wake Forest School of Medicine Student Research Day, Winston-Salem, NC, 11 October 2023, poster #6.

### **Invited Extramural Presentations and Seminars:**

Obermiller C, Bundy R, Witek L, Moses A, Dharod A. **"Exploring EHR use during physician time off (PTO),"** Oral Presentation: AMA EHR Use Research Virtual Summit, December 8th, 2023.

## FACULTY PUBLICATIONS & ACHIEVEMENTS

# Stephen Downs, MD, MS

Professor, Pediatrics – General



### Publications

Zehri A, Touhy PC, Downs SM. "Even Children Can Have High Blood Pressure." *JAMA Pediatr.* 2023 Dec 26. doi: 10.1001/jamapediatrics.2023.5715. Epub ahead of print. PMID: 38147344.

Rigdon J, Ostasiewski B, Woelfel K, Wiseman KD, Hetherington T, Downs SM, Kowalkowski M. "Automated generation of comparator patients in the electronic medical record." *Learn Health Sys.* 2024; 8(1):e10362. doi:10.1002/lrhs.210362

### **In Preparation/Under Review:**

Touhy et al. "Clinician Adherence to AAP Pediatric Hypertension Guidelines."

Vincent et al. "The Cost-Effectiveness of Intensive Blood Pressure Control in Delaying Kidney Replacement therapy in Youth with Mild to Moderate Chronic Kidney Disease."

### Accomplishments

CHICA being incorporated in Encompass harmonization

CHICA-CN go-live at Norton Children's Hospital in Louisville, KY, June 3. Pre-implementation chart reviews complete.

CHICA-CN trial at Wake Forest is done. Post-implementation chart reviews underway.

Serving on Emerging Tech Ethics Committee and FAIR AI Models Committee for Advocate Health

## FACULTY PUBLICATIONS & ACHIEVEMENTS

# Eric Kirkendall, MD, MBI

Co-Director, Center for Healthcare Innovation

Professor, Pediatrics - Hospitalists

Professor, Implementation Science



### Accomplishments

Ongoing participation in Advocate AI Governance group

Center of Healthcare Innovation project: participated in building electronic Cognitive Health Index to help find adults with mild cognitive impairment. Part of a large Alzheimer's Association grant.

# Arezoo Movaghar, PhD

Assistant Professor, Pediatrics



## Publications

Movaghar, Arezoo, Thompson, Lindsay, "Artificial Intelligence Chatbots and Their Influence on Learning", JAMA Pediatrics, in press.

## Accomplishments

### **Grants and Proposals:**

Two-year Trajectory of Health-related Quality of Life Among Adolescents Newly Diagnosed with Systemic Lupus Erythematosus, CARRA-Arthritis Foundation, Role: Co-investigator. Under review.

### **Presentations:**

"AI-Assisted Pre-screening for Fragile X-associated Disorders," Duke Informatics Research Seminars.

"Identifying and Characterizing Fragile X Syndrome from Electronic Health Records." Scientific Seminar Series, Marshfield Clinic Research Institute.

"AI-Assisted Pre-Screening for Fragile X Syndrome," Grand Round Presentation, Population Health Sciences, University of Wisconsin-Madison.

"Application of Big Data and Artificial Intelligence in Medicine," Center for Precision Medicine

"Application of Artificial Intelligence in Medicine," Department of Pediatrics Research Meeting

"Diagnostic Disparities in Patients with Fragile X Syndrome from Diverse Racial and Ethnic Groups," Gatlinburg Conference on Research and Theory in Intellectual and Developmental Disabilities. Kansas City, Missouri, United States, April 17-19, 2024

"Co-occurring Health Conditions of Individuals with Profound Autism: Findings Across 3 Health Care Networks," AIR-P Research Day at Autism CARES Meeting 2024: Translating Research to Community Impact.

## FACULTY PUBLICATIONS & ACHIEVEMENTS

# Da Ma, PhD

Assistant Professor, Gerontology and Geriatric Medicine



### Publications

Ma D, Deng W, Khera Z, Sajitha TA, Wang X, Wollstein G, Schuman JS, Lee S, Shi H, Jin JM, Matsubara J, Beg MF, Sarunic M, Sappington RM, Chan KC. **Early inner-plexiform-layer thinning and retinal-nerve-fiber-layer thickening in excitotoxic retinal injury using deep learning-assisted optical coherence tomography.** Acta Neuropathologica Communications. 2024 Feb 1;12(1):19.

Ma D, Stocks J, Rosen H, Lockhart SN, Bateman JR, Suzanne Craft, Metin Gurcan, Karteeck Popuri, Beg MF, Wang L. **Differential diagnosis of frontotemporal dementia subtypes with explainable deep learning on structural MRI.** Frontiers in Neuroscience. 2024 Feb 7;18:1331677.

Bapat R, Ma D, Duong TQ. **Predicting Four-Year's Alzheimer's Disease Onset Using Longitudinal Neurocognitive Tests and MRI Data Using Explainable Deep Convolutional Neural Networks.** Journal of Alzheimer's disease: JAD. 2024;97(1):459-69.

Lopes DM, Wells JA, Ma D, Wallis L, Park D, Llewellyn SK, Ahmed Z, Lythgoe MF, Harrison IF. **Glymphatic inhibition exacerbates tau propagation in an Alzheimer's disease model.** Alzheimer's Research & Therapy. 2024 Apr 5;16(1):71.

Tiffany Tse, Yudan Chen, Mahsa Siadati, Yusi Miao, Jun Song, Da Ma, Zaid Mammo, and Myeong Jin Ju. **Generalized 3D registration algorithm for enhancing retinal optical coherence tomography images.** Journal of Biomedical Optics (Accepted)

### Accomplishments

#### **Grants:**

[Pending] R01: Neuroimage-genomic fingerprints for subtyping and prediction of Alzheimer's Disease and related dementia

[Pending] Alzheimer's & Related Dementia Network for Treatment & Diagnostics (ALZ-NET) Consortium Real-world platform (IU54AG087506-01)

[Submitted] NACC: National Alzheimer's Coordination Center New Investigator Award

[Submitting] AARG: Alzheimer's Association Research Grant – Integrated Cardiometabolic and Radiogenomic Risk for Alzheimer's Disease

#### **Presentations:**

Da Ma, Samuel N. Lockhart, Timothy M. Hughes, James R. Bateman, Tom Register, Michelle Mielke, Metin N. Gurcan, Suzanne Craft. **Differential whole-brain patterns of cardiometabolic risk and blood biomarker using multi-modal neuroimaging and explainable deep learning.** AAIC 2024

Sophia Kyriacou, Suzanne Craft, Metin Gurcan, Da Ma. **Deep Survival Analysis for Alzheimer's Disease Based on Longitudinal Neuroimaging Data.** AAIC 2024

Linke Li, Metin N Gurcan, Sheng Luo, Da Ma. **Deep-learning-based Polygenic Dementia Risk for Alzheimer's Disease.** AAIC 2024

# Khalid Niazi, PhD

Assistant Professor, General Internal Medicine



## Publications

Su Z, Chen W, Leigh PJ, Sajjad U, Niu S, Rezapour M, Frankel WL, Gurcan MN, Niazi MK. **Few-shot Tumor Bud Segmentation Using Generative Model in Colorectal Carcinoma.** In Proc. of SPIE Vol (Vol. 12933, pp. 129330A-1), 2024.

Su Z, Tavolara TE, Sajjad U, Gurcan MN, Segal S, Niazi MK. **Combining frontal and profile view facial images to predict difficult-to-intubate patients using AI.** In Medical Imaging 2024: Computer-Aided Diagnosis 2024 Apr 3 (Vol. 12927, pp. 125-131). 2024.

Camalan S, Niazi MK, Elmaraghy C, Moberly AC, Gurcan MN. **Tympanic membrane segmentation of video frames to create composite images using SAM.** In Medical Imaging 2024: Computer-Aided Diagnosis 2024 Apr 3 (Vol. 12927, pp. 766-773). 2024.

Sajjad U, Chen W, Rezapour M, Su Z, Tavolara T, Frankel WL, Gurcan MN, Niazi MK. **Enhancing colorectal cancer tumor bud detection using deep learning from routine H&E-stained slides.** In Medical Imaging 2024: Digital and Computational Pathology 2024 Apr 3 (Vol. 12933, pp. 199-205). 2024.

Su Z, Rosen A, Wesolowski R, Tozbikian G, Niazi MK, Gurcan MN. **Deep-ODX: an efficient deep learning tool to risk stratify breast cancer patients from histopathology images.** In Medical Imaging 2024: Digital and Computational Pathology 2024 Apr 3 (Vol. 12933, pp. 34-39). 2024.

Su Z, Chen W, Annem S, Sajjad U, Rezapour M, Frankel WL, Gurcan MN, Niazi MK. **Adapting SAM to histopathology images for tumor bud segmentation in colorectal cancer.** In Medical Imaging 2024: Digital and Computational Pathology 2024 Apr 3 (Vol. 12933, pp. 64-69). 2024.

Tavolara, T.E., Niazi, MK, Feldman, A.L. et al. **Translating prognostic quantification of c-MYC and BCL2 from tissue microarrays to whole slide images in diffuse large B-cell lymphoma using deep learning.** Nature Diagnostic Pathology, 19, 17 (2024).