Department of Biomedical Informatics

Computer Science and Informatics Graduate Program • Laney Graduate School • Emory University

As a student in Biomedical Informatics, you will benefit from a truly interdisciplinary environment and the opportunity to collaborate with experts from the School of Medicine, the School of Nursing, the Rollins School of Public Health, the Laney Graduate School, and the College of Arts and Sciences.

Program Overview

Biomedical Informatics (BMI) studies how biomedical data, information, and knowledge can improve human health. Our students develop advanced computing techniques and strategies that impact patient care and advance biomedical and clinical research. Our graduates find careers in research and teaching in academic and medical institutions, industry, and government and regulatory agencies.

BMI Courses

BMI 500: Introduction to Ethical Data Science and Informatics
BMI 510: Biostatistics for Machine Learning
BMI 520: Practical Computing for Informatics
BMI 532: Model-Based Machine Learning
BMI 534: Introduction to Machine Learning
BMI 536: Introduction to Deep Learning
BMI 539: Topics in Machine Learning*
BMI 540: Time Series Analysis and Modeling
BMI 550: Applied Biomed. Natural Language Processing
BMI 555: Computational Methods for Biomed. Image Analysis
BMI 585: Topics in Biomedical Informatics*

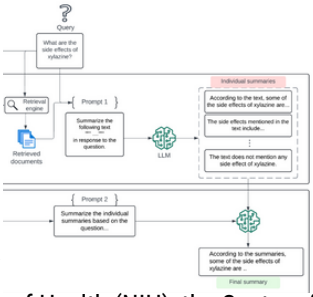
*BMI topics courses introduce new courses to address new research developments and faculty and student interests, including Edge AI, HPC and Cloud Computing for Data, Affordable and Sustainable Healthcare, Reinforcement Learning, Scientific Communication, Kalman Filtering, and Navigating AI Ethics in Health.

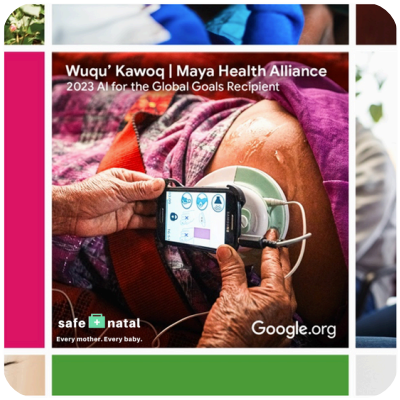
Real Time & Edge AI

Vast volumes of sensitive data are sometimes best processed in real time at the point of care using Tiny ML and edge computing.

Pain, Addiction & Palliative Care

Our studies employ natural language processing, large language models, and multi-agent systems to study critical problems in drug use, pain, mental health, and palliative care from diverse data sources.



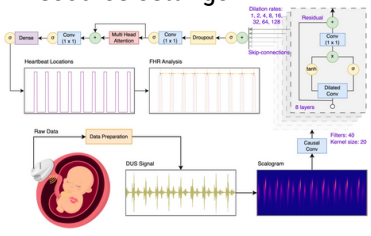


BRAINSS

Center for Brain and Behavior AI for Neurohealth Science and Support (BRAINSS) is new initiative to build a regional and national hub advancing clinically validated, patient-centered AI to accelerate innovation, data-driven assessment, and personalized care.

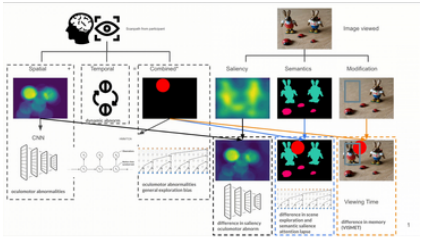
Computational Cardiology

We leverage multi-modal data, including from wearables and electronic health records, to study rare and common cardiovascular diseases. Our research focus includes innovative methods suitable for low-resource settings.



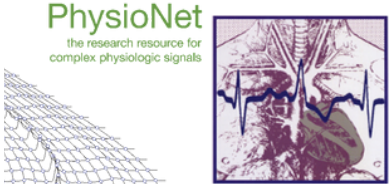
CAIRE

The Center for AI in REproductive health (CAIRE) takes a human-centered approach to developing and deploying artificial intelligence (AI) systems to address gaps in women and child health. Our work spans maternal and child health, menopause, mental health, and sexual health.



PhysioNet Challenges

The PhysioNet Challenges are annual data science competitions that for developing algorithms to address unsolved clinical problems, attracting hundreds of participants and teams from academia and industry each year to advance the state-of-the-art in the problem addressed by the Challenge.



Cancer Informatics

We collaborate closely with the NCI designated Winship Cancer Institute to develop methods for cancer diagnosis, care, prediction, and management.

BMI is funded by National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the National Science Foundation (NSF), Google.org, The Bill & Melinda Gates Foundation, Amazon Web Services, the Gordon and Betty Moore Foundation, Alivecor, and other entities.

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BMI Research Focus Areas

Methods Areas

- AI and ML Theory and Methods
- AI and ML Applications
- Bias, Ethics, and Fairness
- Biostatistics and Bioinformatics
- Biomedical Signal and Image Processing
- Computer Vision
- Edge Computing and Tiny Machine Learning
- High-Performance Computing and Databases
- Human-Computer Interaction
- Natural Language Processing

Application Areas

- Brain Health
- Cancer
- Cardiovascular Disease
- Global/Public/Rural Health and Social Determinants of Health
- Maternal-Child Health
- Pain, Addition, and Palliative Care

For more information about BMI research

https://med.emory.edu/departments/biomedical-informatics/research/

Core BMI Faculty

Gari Clifford, DPhil, *Chair*

Selen Bozkurt, PhD, *Vice Chair for Outreach*

Azra Ismail, PhD, *Co-Director of CAIRE*

Nasim Katebi, PhD, *Co-Director of CAIRE*

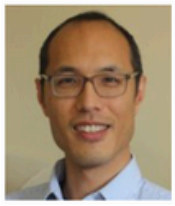
Hyeokhyen Kwon, PhD, *Co-Director of BRAINSS*

Qiao Li, PhD

Babak Mahmoudi, PhD

Lucas McKay, PhD MSCR, *Vice Chair of Capacity Building and Promotion*

Samaneh Nasiri, PhD, *Co-Director of BRAINSS*



Tony Pan, PhD, *Co-Core Director of MIAI*

Saima Rathore, PhD

Matt Reyna, PhD, *Vice Chair for Education and Training*

Reza Sameni, PhD, *Scientific Director of MIAI*

Abeed Sarker, PhD, *Vice Chair for Research*

Yun Wang, PhD,

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Emory University is one of the major scientific research and medical research centers in the Southeast and is among the fastest growing Medical Centers in the United States. Emory is consistently ranked in the top 20 institutions nationally for NIH research support. Newsweek magazine, in a testament to our quality and dedication to education, recently named Emory University as one of the 25 “New Ivies.” Emory is recognized as a leader in higher education in sustainability and has won numerous awards. The Best Colleges has placed Emory in the top 10 in the nation in the categories of greenest universities and the most beautiful college campuses

For additional information, please contact study@dbmi.emory.edu