Artificial Intelligence/Machine Learning Consortium
to Advance Health Equity And Researcher Diversity

AIM-AHEAD
Bridge2AI for Clinical Care Training Program

Cohort I

Informational Webinar

November 6, 2024, 3:00pm CT/4:00pm ET

AIM-AHEAD Coordinating Center is funded by NIH, Agreement No.: 1OT2OD032581

AIM-AHEAD Consortium

Introduction

The Artificial Intelligence/Machine Learning Consortium to Advance Health Equity and Research Diversity (AIM-AHEAD) program was established by the National Institutes of Health (NIH).

Purpose

The purpose of AIM-AHEAD is to enhance diversity in the field of artificial intelligence and machine learning (AI/ML), with emphasis on reducing health disparities and promoting health equity.

This will be achieved by engaging in a fair, equitable, and transparent process of building a consortium of AI/ML partners to promote health equity and an inclusive and diverse workforce.

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The AIM-AHEAD Coordinating Center

Introduction

The A-CC consists of four cores, focused on various initiatives to achieve AIM-AHEAD's mission.

Leadership Core

Lead, recruit, and coordinate the AIM-AHEAD Consortium

Data Science Training Core

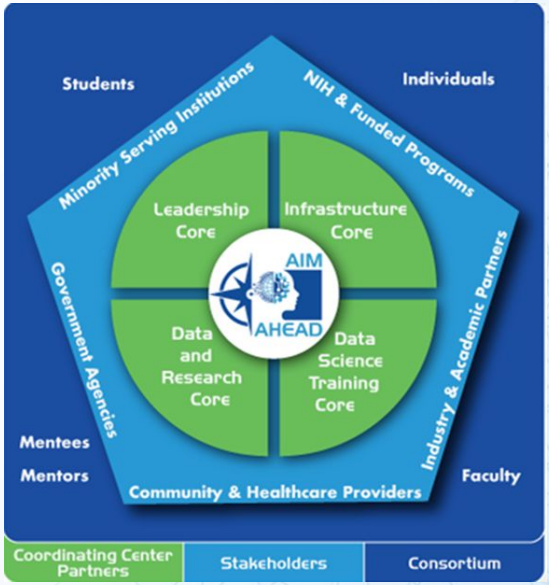
Assess, develop, and implement data science training curriculum

Data and Research Core

Address research priorities and needs to form an inclusive basis for AI/ML

Infrastructure Core

Assess data, computing, and software infrastructure to facilitate AI/ML and health disparities research



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Bridge2AI Consortium

Data	Diverse FAIR AI-ready
Ethics	Accurate Reliable Ethically Sourced
People	Diverse teams Diverse research cohorts Training

Generate new data & best practices to:

- Propel modern AI/ML models to pioneer new science,
- Advance a new culture of ethical considerations for data, and
- Create a modernized workforce that is skilled in this new method of scientific data creation.

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NIH Leadership Team

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AIM-AHEAD Leadership Team

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AIM-AHEAD MPI

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AIM-AHEAD DSTC MPI

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Bridge2AI CHoRUS Leadership Team

Eric Rosenthal
MGH

Azra Bihorac
UF

Xiaoqian Jiang
UT Health

Yulia Strekalova
UF

Parisa Rashidi
UF

Andrew Williams
Tufts

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Program Purpose

Purpose

Expand Data Access: Increase access to Bridge2AI AI/ML for Clinical Care datasets, especially for underrepresented trainees.

Engagement and Training: Provide engagement, training, and mentorship opportunities for trainees on AI/ML and big data analysis.

Focus on Health Disparities: Empower trainees to conduct data-driven research addressing health disparities.

Multi-Modal Data Use: Equip trainees to work with diverse, multi-modal datasets from a broad cohort to conduct impactful AI/ML research.

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Program Partnership

Partnership

Strategic Partnership: AIM-AHEAD and Bridge2AI collaborate to provide specialized AI/ML training for clinical care, leveraging shared resources and expertise.

Combined Expertise: AIM-AHEAD's strength in diverse trainee recruitment and Bridge2AI's AI data and curriculum drive a comprehensive training experience.

Focus on Underrepresented Communities: Jointly committed to expanding AI/ML proficiency in communities historically underrepresented in biomedical research.

Goal: Develop a skilled, diverse workforce prepared to advance health equity through AI/ML applications in clinical care.

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Bridge2AI for Clinical Care Dataset

Multicenter

Multimodal & High-Resolution

- Electronic Health Record Data
- Radiology Images
- Cardiac Telemetry and EEG
- Social Determinants
- Practice-Pattern Metadata

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CHoRUS Dataset

- Retrospective data collection
- Controlled access
- As of November 2024, covers 14 different hospitals with 23.4K unique admissions
  - OMOP and telemetry in enclave except:
    - Clinical notes – stored locally except tokens
    - Imaging – de-id in process at this point
    - EEG – extraction in process at this point
- Datasets are being used for training activities and publications

http://doi:10.1007/s12028-024-02007

Data type	Data standard	Access control	Metadata	Published metadata schema
Demographics	OMOP	Controlled	Yes	Yes (OMOP schema)
Medication administration (dosing time-stamped upon each infusion change or dose administration)	OMOP	Controlled	Yes	Yes (OMOP schema)
Procedures (documentation by providers)	OMOP	Controlled	Yes	Yes (OMOP schema)
Nursing flowsheets (high-frequency documentation)	OMOP	Controlled	Yes	Yes (OMOP schema with extensions)
Diagnoses (documentation by providers)	OMOP	Controlled	Yes	Yes (OMOP schema)
Clinical notes (extracted and tokenized using OHNLP toolkit)	OHNLP	Controlled	Planned	Yes (OHNLP open source schema)
Imaging (from PACS)	DICOM	Controlled	Planned	Yes (DICOM schema)
Waveform telemetry (bedside monitors, gateway/middleware)	WFDB	Controlled	Yes	Yes (PhysioNet schema extended)
Waveform EEG (hospital database)	EDF+ and Persyst	Controlled	Planned	Yes (open source EDF+ and Persyst schema)

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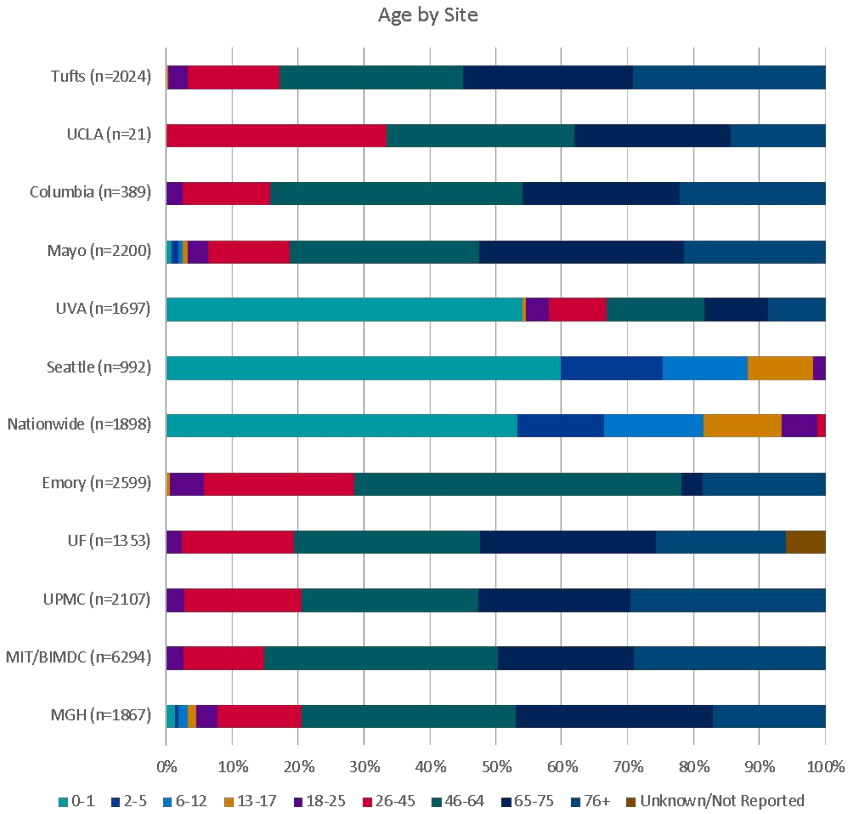
CHoRUS Dataset



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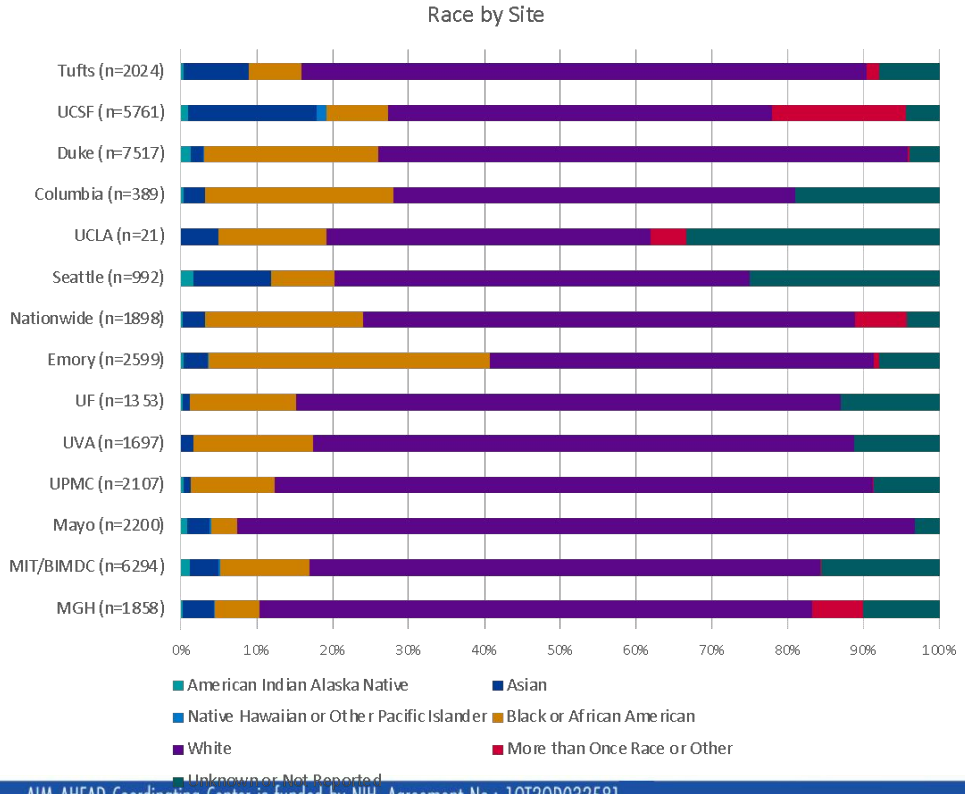

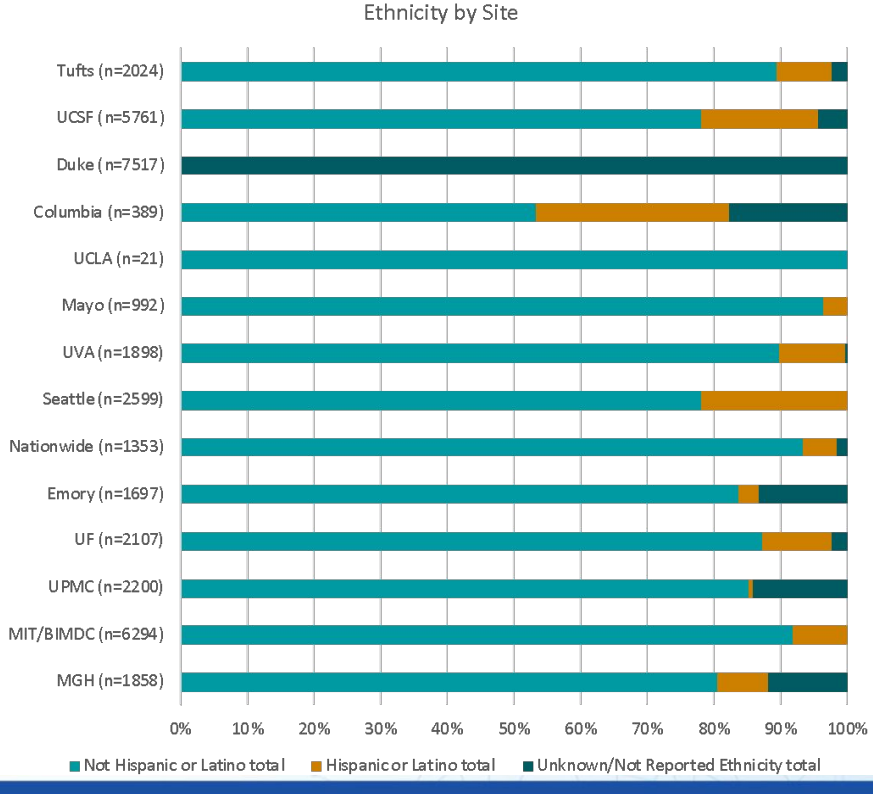

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CHoRUS Dataset

Hospital Data EHR Source Name	Data Source	Data Domain	Data Subdomain	Data Group	OMOP CDM Data Element
Right Neurological Pupil Index (NPI)	CCC CRFs	Patient Assessment	HEENT	Pupil Assessment	Pupil NPI (Right)
Left Neurological Pupil Index (NPI)	CCC CRFS	Patient Assessment	HEENT	Pupil Assessment	Pupil NPI (Left)
R PHS RIGHT PUPILLOMETRY SIZE	Flowsheet Data	Patient Assessment	HEENT	EYES/Vision	Pupillometry Size (Right)
R PHS LEFT PUPILLOMETRY SIZE	Flowsheet Data	Patient Assessment	HEENT	EYES/Vision	Pupillometry Size (Left)
R IP VENT VT HIGH	Flowsheet Data	Organ Support	Mechanical Ventilation	Tidal Volume (Vt) (ml)	V_T HIGH
R IP VENT VT LOW	Flowsheet Data	Organ Support	Mechanical Ventilation	Tidal Volume (Vt) (ml)	V_T LOW
PHS ANES PULSE	Flowsheet Data	Anesthesia	Vitals	Pulse	Anesthesia Pulse
Oxygen Saturation (%)	CCC CRFS	Observations/ Measurements	Vitals	Oxygen Saturation (SpO2)	Oxygen Saturation Measurement

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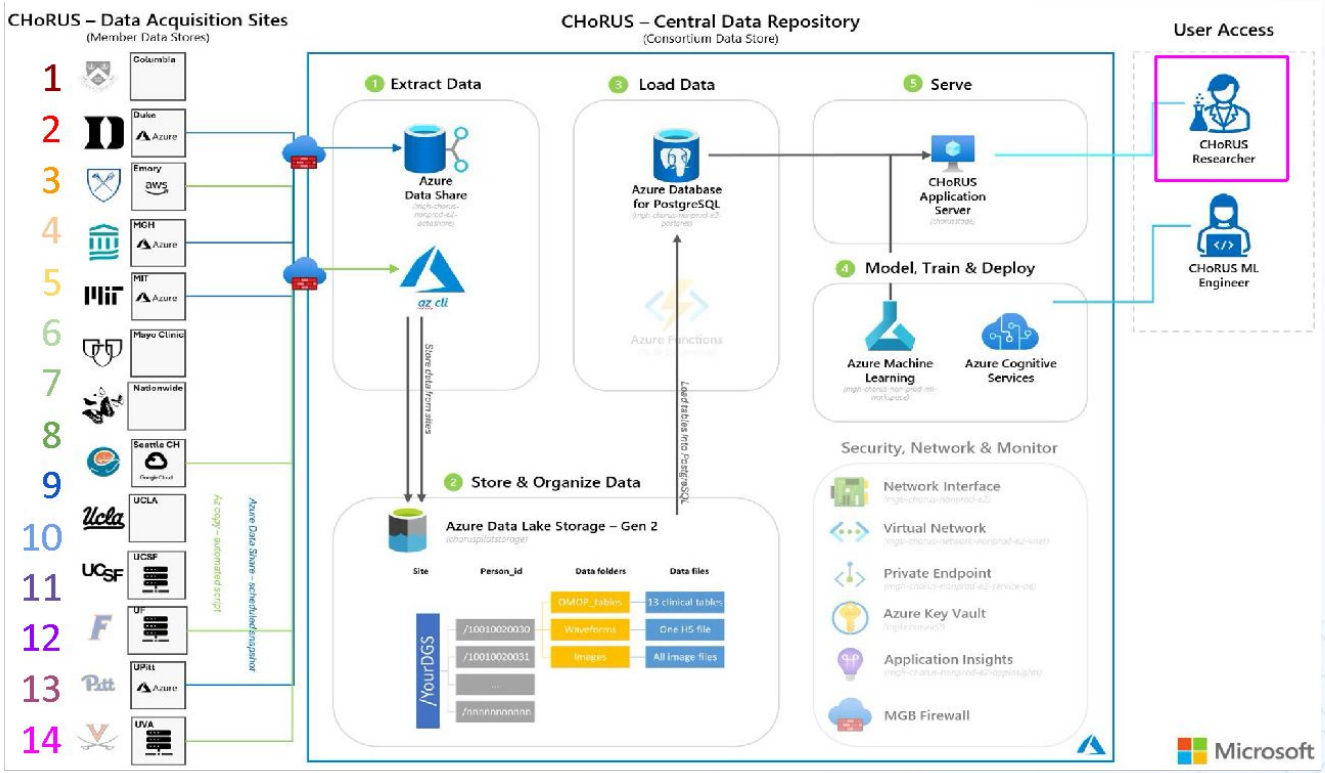
CHoRUS Dataset



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Foundational Hands-On Training

Gain experience with AI/ML in the Bridge2AI CHoRUS ecosystem

Learn fundamental skills, tools, and design patterns for applying AI to clinical problems.

Asynchronous Jupyter Notebooks

- Python and Version Control
- Structured EHR Datasets
- ML for Clinical Applications
- Clinical Deep Learning
- Ethics of Clinical AI

Synchronous Office Hours

- Virtual meetings with AI experts
- Notebook review
- Open Q&A

Hybrid Workshop: AI in Clinical Care

- Guided coding exercises
- Hands-on brainstorming
- Community team building

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Training Overview

Trainees will receive hands-on training on the Bridge2AI AI/ML for Clinical Care Network and leverage the data and tools to create practical use cases, putting their new skills to work in real-life situations and innovative data-driven research. Training will include:

- **Workshops on using Jupyter Notebooks**
- **Workshops on using the OHDSI tool stack**
- **Workshops on the OHDSI/OMOP common data model**
- **Didactics on generative AI and specific use cases**
- **Instruction on creating practical use cases**
- **Virtual live courses**
- **Ongoing mentorship and support using Collaborative Cloud platforms**
- **Hands-on training on the Bridge2AI AI/ML for Clinical Care Collaborative Cloud**

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Program Trainee Objectives

Objective 1	Exhibit advanced expertise in AI/ML principles as they are applied to clinical care.
Objective 2	Develop and present use cases suitable to apply in Bridge2AI Data Topics.
Objective 3	Participate directly in joint research and development projects on the Bridge2AI AI/ML for Clinical Care Collaborative Cloud platform, utilizing the expertise and insights gained from the program and interfacing with the BRIDGE Center ethics expertise in AI/ML biases and privacy preservation.
Objective 4	Prepare a compelling poster presentation for the AIM-AHEAD Annual Meeting and the Bridge2AI Annual Meeting in 2025, submit an abstract for a health informatics conference, or develop a manuscript for a peer-reviewed journal.

Outcome

After completing the program, trainees will understand how to develop real-world use cases and how to address ethical concerns such as bias and privacy. They will be equipped to engage in collaborative research on the Bridge2AI platform, and will join a committed community of professionals dedicated to extending AI/ML benefits to underrepresented communities in biomedical research.

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Curriculum Overview

Hosts: MGB, UF, UTH, Tufts

Delivery: Live Online, Recorded, Asynchronous

Format: Didactic, Workshop, Office Hours, Self-Directed

Examples

Host	Lecturer(s)	Delivery	Approach	Topic and Description
MGB	Morteza Zabihi	Live Online	Didactic	**Machine Learning Basics** - Intro to ML methods for AI
UF	Zhenhong Hu	Self-Directed	Python Notebook	**Intro to Python & Version Control**
UTH	Debora Simmons	Recorded	Lecture	**Ethics of AI in Clinical Practice** - Safety, risk, and legal considerations
Tufts	Andrew Williams	Live Online	Didactic	**Working with EHR Data** for Research
MGH	Aliyah Geer	Workshop	Collaborative	**Data Schemas in Clinical Cloud**

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Curriculum Overview

AI-LEARN Curriculum for Bridge2AI diverse learning communities

Format: Online, self-paced with video lectures, case studies, and exercises.

Certification: Available upon completion.

Courses to leverage & Sync DSTC_MHRI Workshops

Curriculum Offering	Target Audience / Purpose	Key Topics
AI/ML Essentials for Healthcare	No coding; healthcare workers	Intro to AI/ML, ethics, patient engagement, health equity
Open Data Science for All	Beginners to intermediate learners	Data science basics, supervised/unsupervised learning, AI trust, healthcare applications
Advanced Decision-Making Models	Focus on model selection for healthcare	Statistical modeling, decision trees, healthcare use cases
Cutting Edge AI Training Modules	Keeping up with AI advancements	Integration with DSTC_MHRI workshops, latest AI/ML trends

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Requirements for Accessing Data

Registration

- Participants will fill out a registration form with name, email, and institution
- Email must be an institution email not a personal
- Once access is granted you will receive an email with how to gain access

Licensing Agreement

- All participants must sign a licensing agreement

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Trainee Expectations

In order to successfully complete the program, selected trainees must:

Time Commitment: Be able to commit to 8 hours per week (on average) of coursework and synchronous class sessions

Attendance: Attend one virtual, synchronous class session per week (day of the week and time TBD)

Assignments: Complete all assigned milestones and goals

Presentation of Work: Attend both the AIM-AHEAD Annual Meeting (July 2025) and the Bridge2AI Annual Meeting (May 2025) and present a works-in-progress poster.

*These are both in-person events and a $2,000 travel allowance will be given to each trainee for travel expenses.

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Program Benefits

Stipend

An $8,000 stipend upon successful completion of trainee milestones

A $2,000 allowance to attend the AIM-AHEAD Annual Meeting and the Bridge2AI Annual Meeting in 2025

Support

Support and guidance from an experienced AIM-AHEAD mentor

Support from the AIM-AHEAD Data Science Training Core

Direct 1:1 guidance, virtual office hours, helpdesk support and concierge services supporting R and Python coding and the OHDSI tool stack

Training

Training on:

- Introductory machine learning and feature engineering
- The Bridge2AI AI/ML for Clinical Care Collaborative Cloud
- Ethics and Policy issues in AI/ML
- AI/ML for Clinical Care canonical Jupyter Notebooks
- The OHDSI/OMOP common data model

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AIM-AHEAD Mentorship Process

Each trainee will be matched with a mentor who will provide ongoing support throughout the training program. Mentors are matched with mentees using the Connect Platform. Mentorship matches are made using:

AIM-AHEAD CONNECT

- AI Algorithm
- Administrative Matching
- Mentor Pool Search

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Applicant Eligibility

Citizenship

- Must be a U.S. Citizen, Permanent Resident, or Non-Citizen U.S. National

Education

- Post-baccalaureate and graduate students, early-career investigators, or employees with a bachelor's degree in a related field

Skills & Experience

To ensure success in the training program, applicants must already possess certain skills, knowledge and experience. These include:

- Practical experience in coding/programming with R or Python
- Basic understanding of statistics

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Institutional Eligibility

Non-Academic Organizations

- ☑ Nonprofits with or without 501(c)(3) status, Tribally derived institutions, or For-Profit Businesses
- ☑ Must be a domestic organization located in the United States and its territories

Higher Education Institutions

- ☑ Public, Private, HSIs, HBCUs, TCUs, AANAPISI, or NAH Serving Institutions
- ☑ Must be a domestic institution located in the United States and its territories

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Application Requirements

Submission Deadline: November 18, 2024 by 11:59 PM EST

- **Profile Information**: Name, organization, department, position, research area, and contact.
- **Letters of Support:** A supervisor's letter confirming training time and contact info is required, along with one faculty recommendation attesting to the applicant's skills and readiness for advanced data analytics.
- **Transcripts:** Official or photocopy of undergraduate and graduate (if applicable).
- **NIH Biosketch or CV:** Max 5 pages.
- **Statement of Rationale**: Max 900 words—goals, research question, coding plan, relevant experience, and long-term objectives.

*This is just an overview. Please see the CFA for the full list of application requirements.

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Application Process

Applications must be submitted between October 18, 2024 and November 18, 2024 at 11:59 PM EST

Note: Please use Chrome, Firefox, or Edge browser

1. Familiarize yourself with the program requirements outlined in the call for applications
2. Gather all of the required application materials
3. Create an account on AIM-AHEAD Connect and register as a "mentee/learner"
4. Submit application for review using the InfoReady platform

Up to 25 trainees will be selected

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Program Timeline

Funding Cycle	2024-2025
Program Length	8 months
CFA Release Date	October 18, 2024
Application Deadline	November 18, 2024 by 11:59 PM EST
Notice of Award	January 6, 2025
Program Start Date	January 15, 2025
Bridge2AI Annual Meeting 2025	May 2025
AIM-AHEAD Annual Meeting 2025	July 2025

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Questions?

PDF

Please see the PDF linked in the chat for more helpful links and resources.

SCAN ME

Scan the QR code above to access the AIM-AHEAD Bridge2AI for Clinical Care CFA.

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