

Reducing Bias in AI/ML Research

Standardization, Harmonization, and Interoperability for Multi-omic Data and EHR for Marginalized Community Subsets

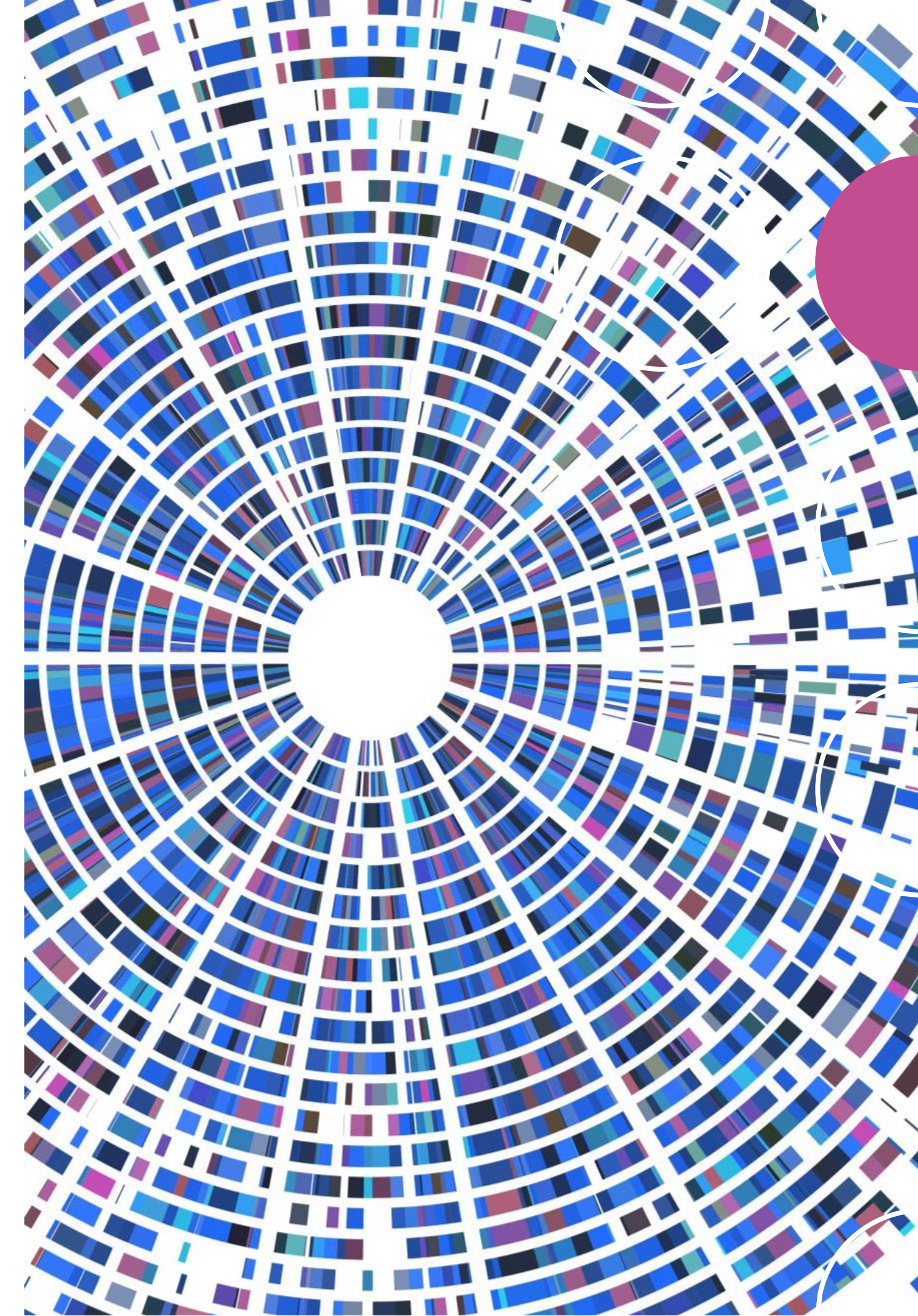
JAMES BURROUGHS



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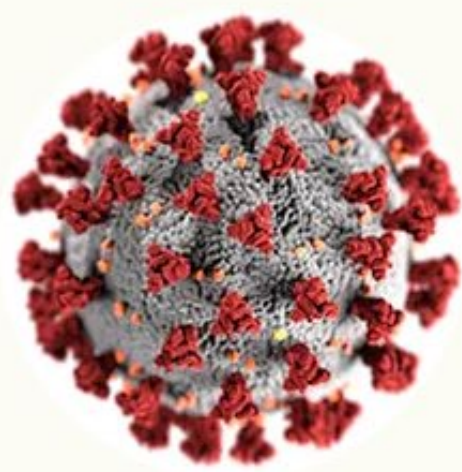
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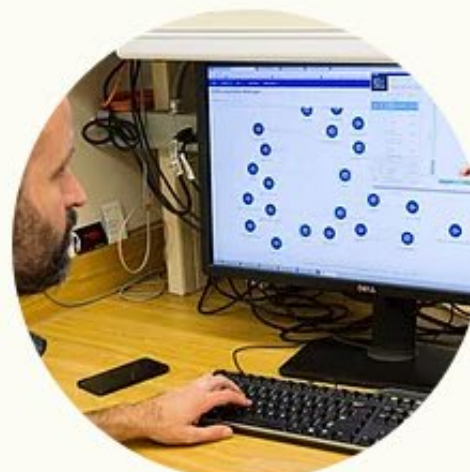
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AI-ML Derived Technologies
Reducing COVID-19 Disease
Concentrations Among Minority
Communities



Elucidation of Endogenous
Molecular Mechanisms Associated
with Differential Clinical
Outcomes Variable by Race and
Ethnicity



Environmental Factors Associated
with Epigenetic Modulation of
Chronic Disease

NCHEP AI/ML SDOH Research Portfolio and Works in Progress

High Level, Primary Challenges for AI/ML-based Research in Health Sciences for Marginalized (racial and ethnic minority and SGM) Cohorts

- Ethnocultural and historical barriers to participation and inclusion in studies result in limited representation for appropriate training data
- Current evidence-based physiologic metrics with “canonical” or clinically “normal” reference value ranges have not historically been representative of the diversity and resulting physiologic and phenotypic variability among US populations (disaggregated by cohort or strata), with few studies looking retrospectively across cohorts to assess the normality of these data or provide more inclusive reference ranges
- Consensus-based standardization and harmonization interim guidance differ across industry, government, and regional constituencies
- Historically suboptimal utilization of Z Codes provided in ICD-10-CM among HCPs across EHR impedes progress for standardization and harmonization
- Barriers to meeting infrastructural requirements for data sharing prevent many MSIs from inclusion in robust data-sharing among non-MSI peers

Fundamental Ontological, Ethnocultural, and Ethical Considerations for Use of Race and Ethnicity Data in AI/ML-based Research

1

Race as a social construct

2

Race as individual and community self-identification and belonging

3

Race as a social determinant of health

Technical and Practical Challenges to Advancing Transparency of AI/ML-enabled Medical Devices

- Mutability of self-identification along racial and ethnic strata may confound longitudinal studies, important for upstream AI/ML-based research which supports development of AI/ML-enabled medical devices
- Access to technology and infrastructure resources present tremendous barriers to researchers outside of larger academic institutions, with disparities across MSI vs. non-MSI entities
- Variability in the scope and enforceability of interim guidance for standardization, harmonization, and interoperability of upstream AI/ML-based research
- Suboptimal diversity and inclusive representation in leadership, among both industry and governmental constituencies may promulgate existing inequities, and intensify the consequences thereof through AI/ML-based research

Acknowledgements and Contact Information

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- HealthIT.gov
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- NIH

Contact:

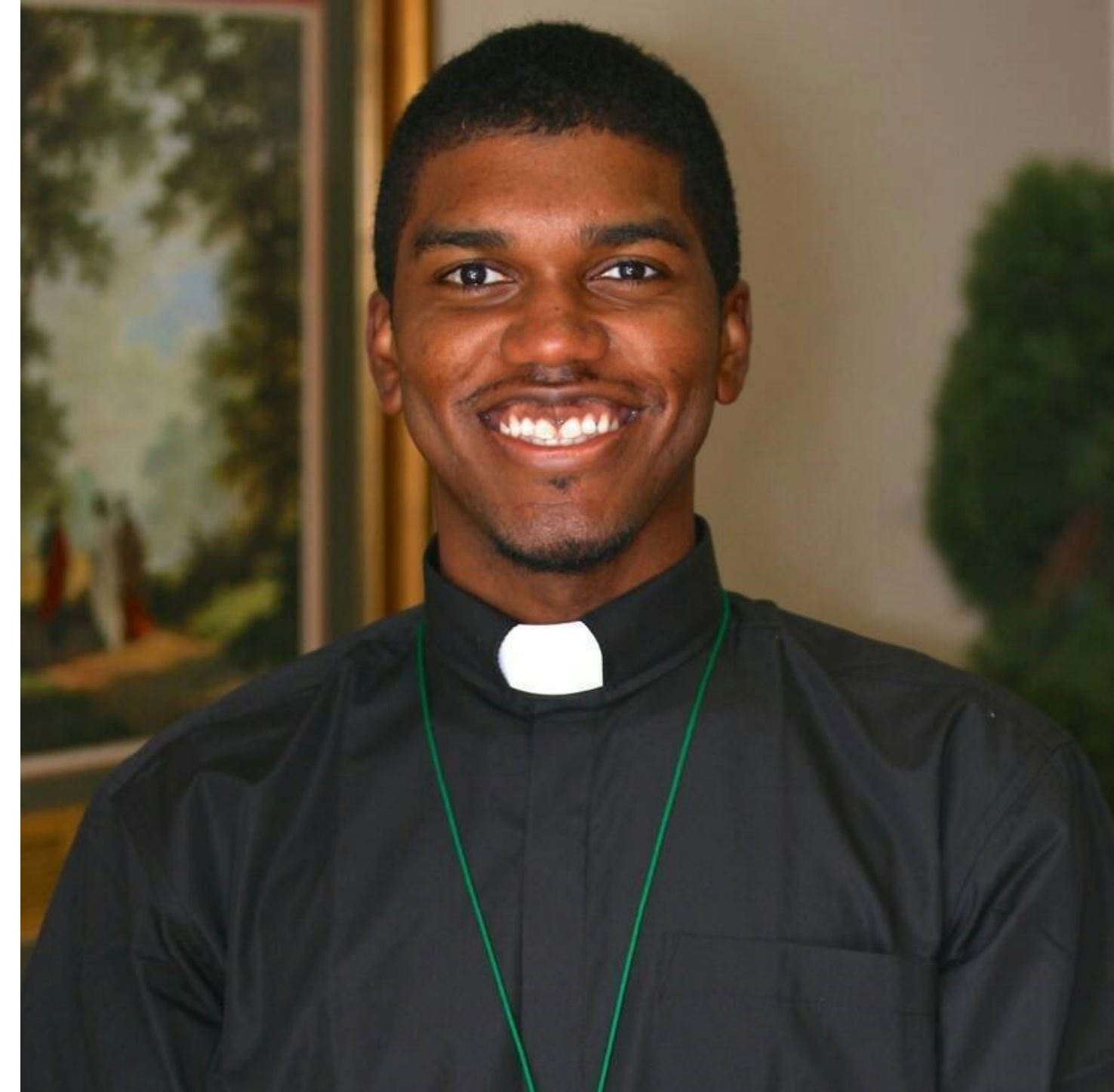
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