



Karen B. Eden, Ph.D.
Professor and Interim Chair

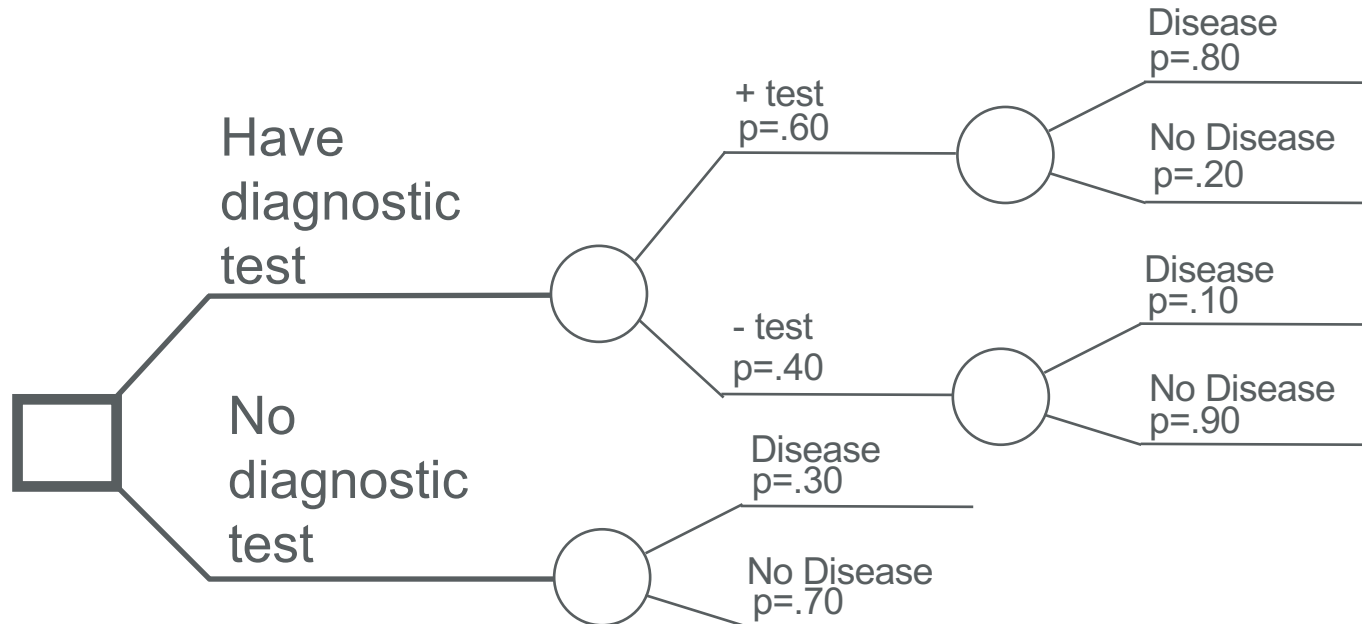
Interests: Evidence-based medicine, shared decision making, decision making tools

Decision Making Projects: breast cancer screening, lung cancer treatment, OHSU Respect for All Mobile App: <https://ohsurepectforall.com/>



Medical Decision Making

BMI 538/638, Online, Winter 2024



Meysam Asgari, PhD



- Instructor for BMI 539A (639A): *Deep Learning I*
- Instructor for BMI 539B (639B): *Deep Learning II*

- **BMI 539A** covers several topics in machine learning with a specific focus on deep neural networks (DNNs) including model capacity, regularization, optimization techniques, feed-forward, convolutional, and recurrent neural networks. The topics are purposely chosen to cover all the background material that students need to effectively train DNNs through *supervised techniques* in their research problems.

Meysam Asgari, PhD

- **BMI 539B** covers two areas of deep learning in which labeled data is not required: Deep Generative Models and Unsupervised Learning. Topics include energy-based models (e.g., restricted Boltzmann machines), autoencoders, variational autoencoders, generative adversarial networks, in addition to a brief overview on elements of Bayesian inference including Monte Carlo techniques (e.g., Gibbs sampling and Metropolis-Hasting) and variational inference.
- This is a second course in the sequence of “deep learning” topics and only those who have previously taken the “Deep Learning I” are encouraged to enroll this class.

Meysam Asgari, PhD

- Dr. Asgari's research interest lies in the areas of deep learning, speech and language processing, and machine learning. He is particularly interested in tackling problems of speech and language processing that is motivated by practical needs in the biomedical applications and human health domain.
- His research is focused on innovative computational methods to develop automatic speech recognition (ASR) and machine learning algorithms for analysis of speech and language samples of clinical groups, e.g., individuals with Alzheimer's disease (AD) and children diagnosed with Autism Spectrum Disease (ASD).

Steven Bedrick, PhD



- Instructor for BMI 525/625: *Principles & Practice of Data Visualization*
- Instructor for BMI TBD: *Natural Language Processing*

- BMI 525 covers both theoretical and practical aspects of data visualization. Topics include scientific figures, maps, and interactive visualizations; it is also a fabulous way to build up your data wrangling skills, as there are a *lot* of hands-on assignments!
- BMI TBD covers applications of machine learning to natural language processing. Topics covered include text classification, sequence labeling and prediction, machine translation, and statistical parsing with context-free grammars; we cover both neural and non-neural (“classical”) techniques.

Steven Bedrick, PhD

From a clinical perspective, my work falls into two broad areas of work:

1. Applying speech and language technologies to problems relating to communication disorders, both in terms of assessment as well as Augmentative and Alternative Communication applications
2. Automated analysis of scientific literature and electronic medical record data

From a computational perspective, I am particularly interested in language modeling, representation learning, and statistical methods for ML evaluation.

Steve Chamberlin, ND,MS,MAc

- Instructor for BMI 531: Probability and Statistical Inference
- Co-instructor for BMI 527: Applied Data Science and Machine Learning
- BMI 531 Mathematical and statistical foundations in support of machine learning theory and application. Topics include probability, inferential statistics, linear algebra, vector calculus and optimization.
- BMI 527 This class develops a real world machine learning solution to a problem in health care. The full life cycle of a machine learning project is taught, including data source identification, data preparation, feature engineering, model development, model implementation and ethical considerations.



Steve Chamberlin, ND, MS, MAc

I am both a clinician and researcher. My research interests and experience includes:

- ✓ Computational methods to identify natural product treatments and combinations for cancer treatment
- ✓ Systems immunogenetics research for infectious disease
- ✓ Mechanistic research for botanical medicine treatments for neurological conditions related to aging
- ✓ Whole person research methodologies
- ✓ Technology approaches to remove barriers for patients to integrative oncology approaches
- ✓ Effective implementation of machine learning models in health care settings
- ✓ Information retrieval and natural language processing

Aaron M. Cohen

Research Interests

- Apply biomedical text processing to enhance the capabilities of biomedical researchers, curators, annotators, and systematic reviewers:
 - Confidence based retagging of publication evidence types
 - Patient cohort identification
 - Rare disease detection
- Apply advanced analytics to improve healthcare resource management and process redesign:
 - Risk modeling using a wide selection of coded and raw data types
 - Sub-phenotype exploration and discovery
- Design and adapt new approaches to solve computational challenges in biomedical research:
 - OCTRI NLP capability evaluation to enhance research with unstructured EHR data

Aaron M. Cohen

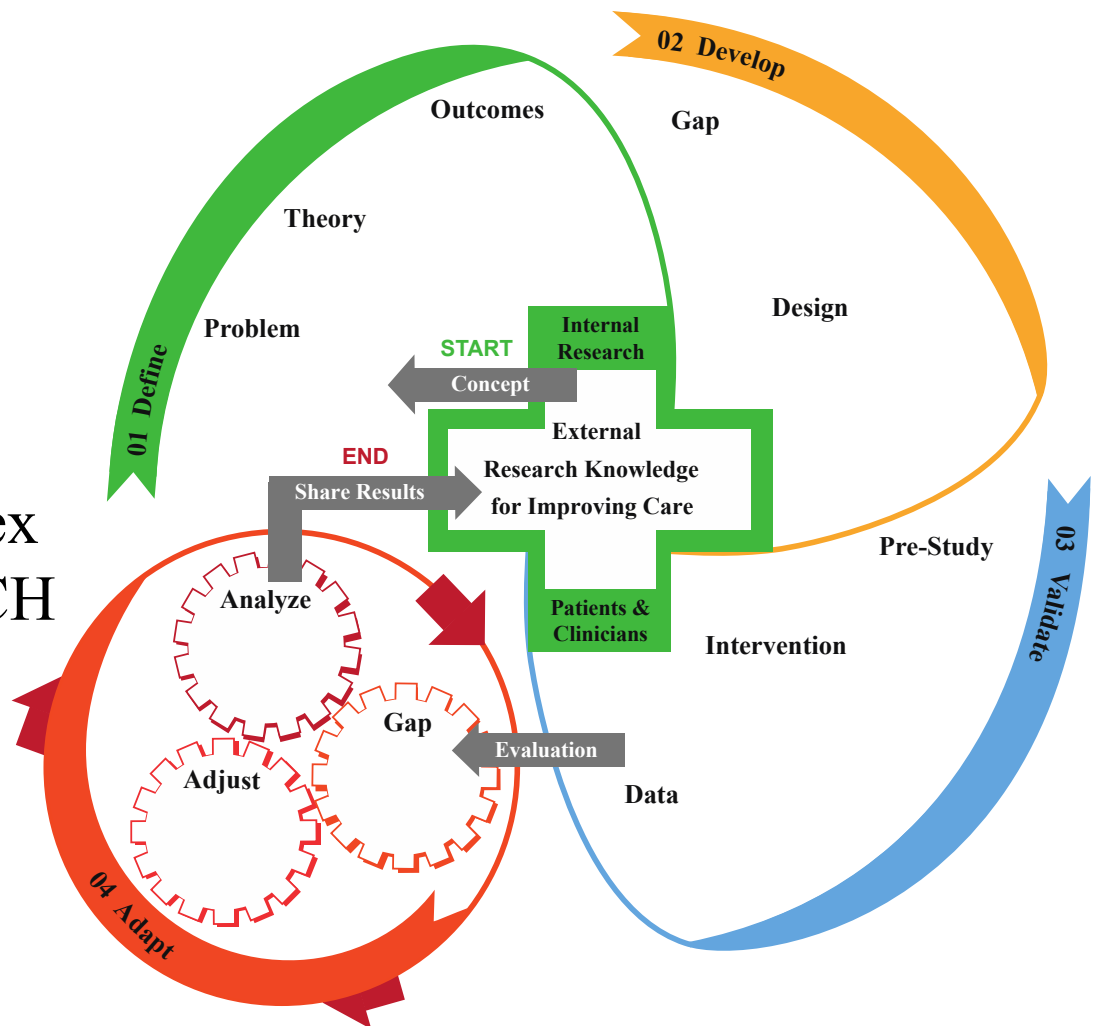
Teaching

- Software Engineering (BMI 546, Spring Term)
- Director of the Informatics Discovery Lab (IDL), industry partnership projects
- Projects for the *Research In Bioinformatics* course (BMI 652)
- Mentor and advise Masters and PhD students with computational backgrounds interested in biomedical text processing and/or machine learning
- Mentor student teaching for PhD candidates

David Dorr, MD, MS

- Roles

- Chief Research Information Officer
- Internist
- Professor and Vice Chair, Clinical Informatics
- Researcher in complex illnesses – see COACH





David Dorr, MD, MS

What does the CRIO do?

Engages and listens to stakeholders

Develops and articulates a shared vision for research informatics

Implements a plan for achieving the vision

Reduces barriers to collaboration, especially around data sharing, algorithm, software and tool use, and partnerships

Improves the connections of our *people, data, and tool* infrastructures (CD2H)

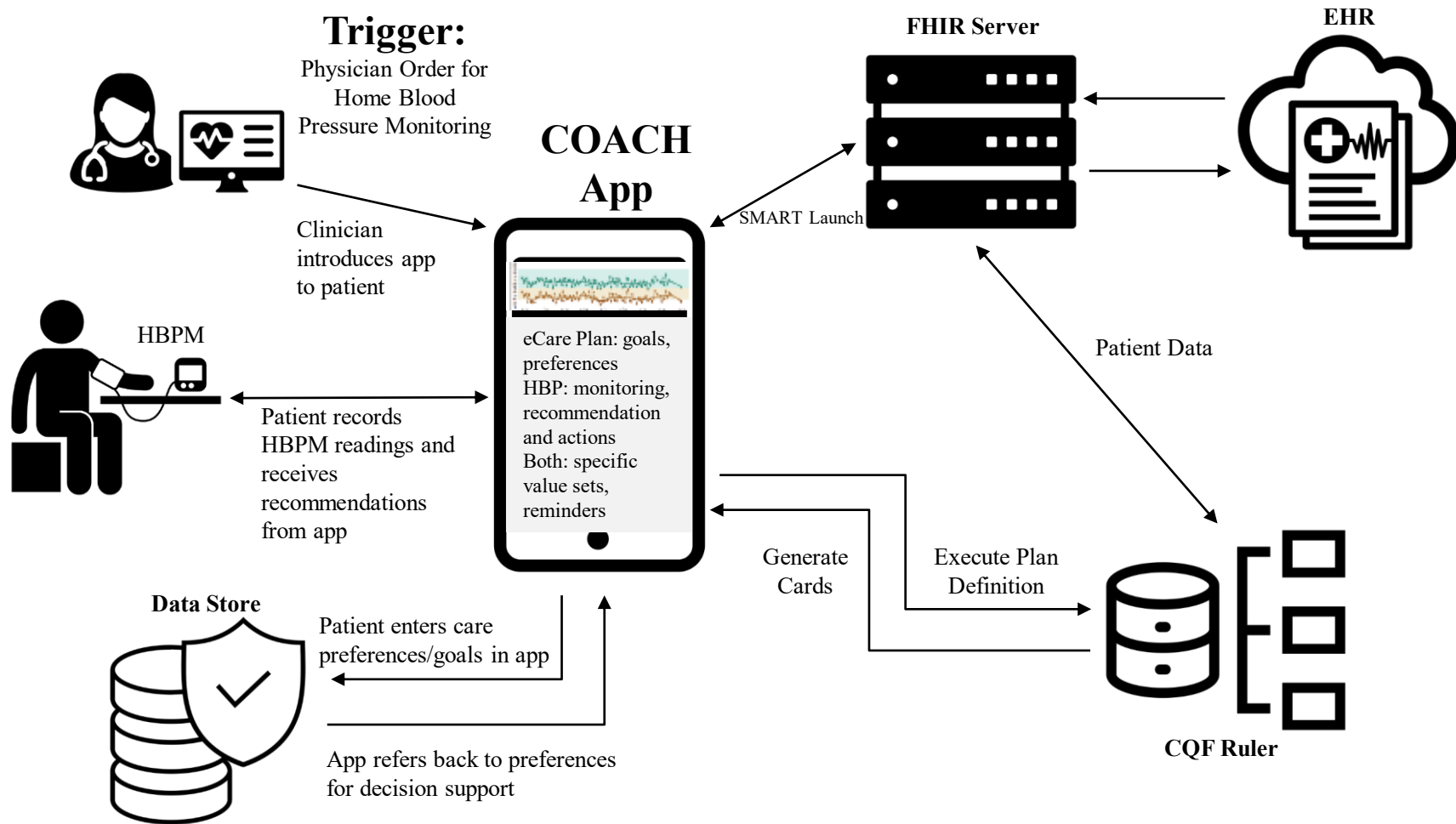
Communicates and responds

Collaboration Oriented Approach to Controlling High blood pressure (COACH)

AHRQ U18HS026849

dorrd@ohsu.edu

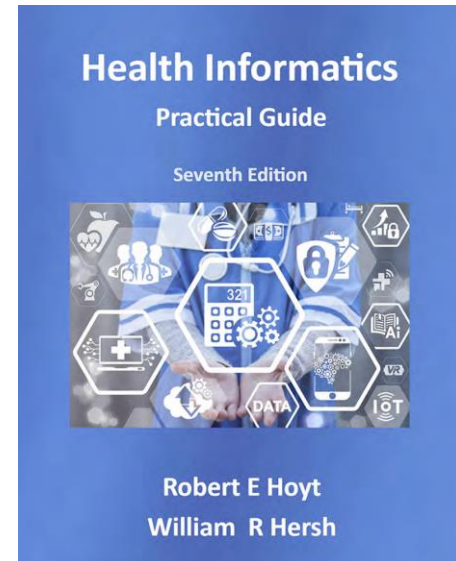
storer@ohsu.edu



David Dorr, MD, MS

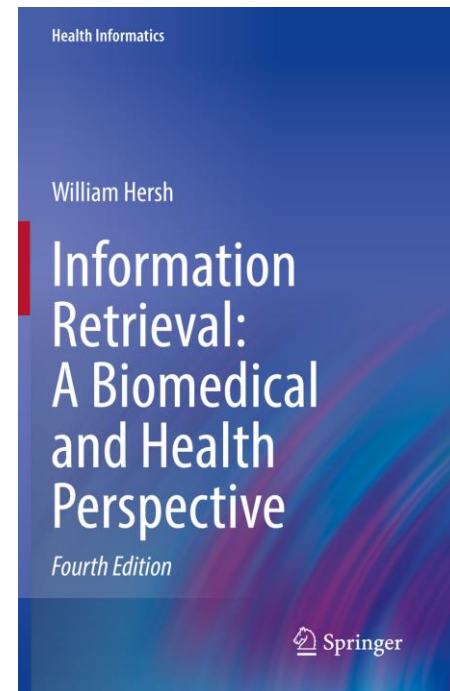
William Hersh, MD – Education

- Have led OHSU to national prominence in informatics education
 - Awards
 - AMIA Lindberg Award for Innovation in Informatics, 2008
 - Modern Healthcare Top 25 Clinical Informaticists, 2010-2012
 - HIMSS Physician IT Leadership, 2015
 - Awarded many grants over the years for training and education
 - Training: NLM T15, Fogarty
 - Education: ONC Health IT Curriculum, NIH Big Data to Knowledge Open Educational Resources
- Still love to teach
 - BMI 510/610
 - AMIA 10x10 (“ten by ten”) program
 - BMI 536/636
- Co-Editor, *Health Informatics: Practical Guide, 7th Edition*, Lulu.com, 2018
- President, International Society of Health Sciences Informatics (IAHSI), 2020-2022



William Hersh, MD – Research

- Information Retrieval (aka, Search)
 - Access to online information, from journals, Web sites, images, etc. to electronic health records (EHRs)
 - Major effort now focused on cohort discovery in EHR – opportunities for students and fellows
 - Recently published 4th edition of textbook (2020)
- Systematic reviews of informatics applications
 - Telemedicine and telehealth
 - Health information exchange
- Informatics Workforce and Education
 - How do we characterize workforce needed and its optimal education and training?
 - Metadata for educational resources



Chris Hoekstra, DPT, PhD – Assistant Professor

Teaching

- BMI 517/617 – Organizational Behavior and Management in Informatics
 - Explores the interaction of people, teams, leadership, and technology
 - Emphasizes the application of organizational behavior principles to technology implementation projects
- BMI 561/661 – Qualitative Research Methods
 - Explores research methods and nuances of inductive/qualitative analysis methods
 - Emphasizes approaches to rapidly understand multiple stakeholder perspectives for both evaluative and research projects

Chris Hoekstra, DPT, PhD – Assistant Professor

Professional Work

- I have worked as a clinician, manager, executive, and health IT consultant
- My work has focused on clinical quality and value projects with emphasis on information systems' impact on these endeavors

Research

- My mixed-methods research focuses on organizational facilitators and barriers to the use of HIT for the management of clinical quality and value, extending current sociotechnical and technology adoption models
- I am also involved in a AHRQ-funded mixed-methods study focused on training and safety of medical scribes

Michelle R. Hribar, PhD

Research Interests

- Secondary use of EHR data
 - Audit log data for studying clinic workflows
 - Notes and audit log data for studying documentation
 - Ophthalmic data for clinical prediction models
- Quality of ophthalmic digital data
 - Ability to be reused for quality measurements, patient cohort identification, machine learning models
 - Recommendations for EHR improvements

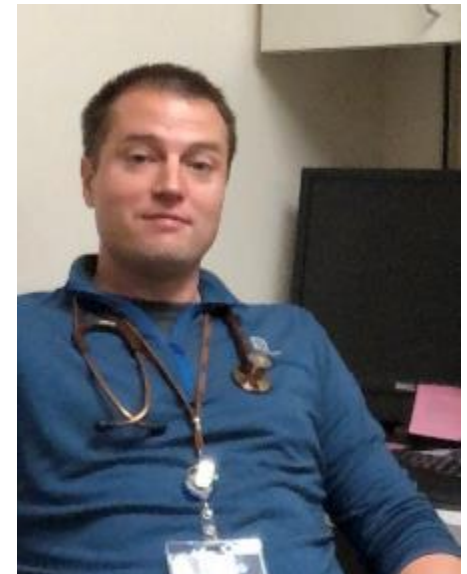
Michelle R. Hribar, PhD

Teaching

- Computer Science & Programming for Clinical Informatics (BMI 540, Fall Term)
- Human-Computer Interaction in Biomedicine (BMI 548, Summer Term)

James Jacobs MD, MPH

- Instructor for BMI 550/650: Bioinformatics and Computational Biology I: Algorithms
- Instructor for BMI 551/651: Bioinformatics and Computational Biology II: Statistical Methods in Computational Biology
- BMI 550/650 introduces the principals of algorithm development and application to biological problems
- BMI 551/651 deals with the principals and methods of statistical learning. Emphasis is on conceptual understanding of the tools needed for applications in supervised and unsupervised learning



James Jacobs MD, MPH

My research is in the computational analysis of the interaction between the immune system and malignancy as it relates to disease development, progression and resistance to therapy.

Specifically, I study the bone tumor, osteosarcoma, in childhood and adolescences.

My work utilizes both whole genome sequencing as well as network-based methods based on gene expression data.

Lisa Karstens, PhD



- Teaching:
 - Teaches foundation programming concepts and skills in the **Introduction to programming** prerequisite course
- Research:
 - Developing and refining computational techniques for identifying the role the microbiome plays in human disease.
 - Focuses on how the urinary and vaginal microbiomes contribute to non-infectious bladder disorders in women.
 - Uses a multi-omic approach with high throughput methods including 16S rRNA gene sequencing and metabolomics



Michael Lieberman, MD, MS, FAMIA

Instructor for:

- BMI 537: Healthcare Quality
 - BMI 537 covers methods for measuring, managing and improving the quality of health care.
 - It includes an overview of the US health care system and beyond as well as quality challenges and issues in these systems. Students are taught the principles of quality improvement and are expected to be able to apply them in practical settings. Current national efforts in performance measures, financial incentives and quality are also covered.
- BMI 544: Databases
 - An introduction to databases and modern database concepts. The primary topics covered in this course include data and data organization, database principles, relational databases, database design, the SQL query language, database optimization, data warehousing, big data and NoSQL.



Michael Lieberman, MD, MS, FAMIA

In addition to teaching, I practice general internal medicine and work in operational informatics.

Clinical quality measurement has been a common thread throughout my career. I have worked in this area from both the vendor and healthcare provider perspective.

I'm particularly interested in building and implementing systems that can truly improve quality without adding to the documentation burden for providers and support staff.

Through my work in quality measurement I have also developed an interest in data modelling and extraction leading to expertise in databases.

Shannon McWeeney, PhD

Professor and Division Head

- ✓ Development and application of statistical and computational methodologies to solve research bottlenecks
- ✓ Integrated approaches to facilitate identification of therapies for Precision Medicine clinical trials



mcweeney@ohsu.edu



WonderMixTape



Vishnu Mohan MD MBI FACP FAMIA

Professor and Vice Chair, Department of Medical Informatics & Clinical Epidemiology
Program Director, OHSU Clinical Informatics Fellowship Program
Graduate Program Director, DMICE
Oregon Health & Science University
Portland, OR, USA

mohanv@ohsu.edu

Vishnu Mohan

Introduction:

Medical school in India → residency + internal medicine clinical practice in Pittsburgh, PA → moved to Portland, OR for the rain + the beer

DMICE alum → initially a Certificate student, then MBI

Board certified in clinical informatics (first person to be certified in the US west coast!) and internal medicine

Inaugural Fellow of the American Medical Informatics Association (FAMIA)

Formerly Associate Program Director of an internal medicine training program before joining DMICE

Now Program Director of OHSU's clinical informatics subspecialty fellowship program (one of the first CI fellowship programs to be certified by ACGME)

Graduate Program Director, DMICE

Vice Chair for Education, DMICE

Vishnu Mohan

Teaching:

BMI 512 (Clinical Information Systems)

BMI 560 (Design and Evaluation in Informatics)

BMI 519 (Business in Healthcare Informatics)

Also teach clinical informatics fellows, medical residents + medical students

Vishnu Mohan

Areas of interest:

E-iatrogenesis and patient safety

High fidelity EHR simulations

Advanced EHR training

Medical + informatics education and workforce development

Recent areas of research:

Developing a simulation-based EHR training for clinicians to optimize EHR use and provide safer clinical care

Creating curricula and training materials for medical scribes

Using high-fidelity simulation to improve EHR safety

Developing tools and guides to improve EHR safety

Vishnu Mohan

Some recently published papers you may find interesting (or not):

Dixit RA, Boxley CL, Samuel S, **Mohan V**, Ratwani RM, Gold JA. Electronic health record use issues and diagnostic error: a scoping review and framework. *Journal of patient safety*. 2023 Jan 1;19(1):e25-30.

Mohan V, Garrison C, Gold JA. Using a new model of electronic health record training to reduce physician burnout: a plan for action. *JMIR Medical Informatics*. 2021 Sep 20;9(9):e29374.

Florig ST, Corby S, Rosson NT, Devara T, Weiskopf NG, Gold JA, **Mohan V**. Chart completion time of attending physicians while using medical scribes. In *AMIA Annual Symposium Proceedings 2021 (Vol. 2021, p. 457)*. American Medical Informatics Association.

Gold JA, Becton J, Ash JS, Corby S, **Mohan V**. Do You Know What Your Scribe Did Last Spring? The Impact of COVID-19 on Medical Scribe Workflow. *Appl Clin Inform*. 2020 Oct;11(5):807-811.

Kannry J, Smith J, **Mohan V**, Levy B, Finnell J, Lehmann CU, Clinical Informatics Program Directors Group-AMIA. Policy Statement on Clinical Informatics Fellowships and the Future of Informatics-Driven Medicine. *Appl Clin Inform*. 2020 Oct;11(5):710-713.

Unfortunately the COVID-19 pandemic forced many people to cancel their travel plans for an extended period of time.

I am pleased to report that I was able to travel frequently to many exotic destinations throughout the pandemic.

Here is a picture from one of my trips:



hello new dmice students

Michael Mooney, PhD

- Instructor for BMI 565: *Bioinformatics Programming & Scripting*
- Co-instructor for BMI 535: *Management & Processing of Large-scale Data*
- BMI 565 teaches the fundamentals of Python programming and Linux scripting, and provides hands-on experience with tools relevant for bioinformatics tasks.
- BMI 535 provides an intro to data management for large-scale biomedical data. Topics covered include SQL, NoSQL, distributed file systems and parallel computing.



Michael Mooney, PhD

My research involves developing statistical and computational techniques for identifying predictive signatures of disease susceptibility and outcome.

Much of my work has focused on the discovery of polygenic effects (the combined effects of many genes) in complex diseases. Recently I have begun collaborating on epigenetic studies looking at DNA methylation patterns as biomarkers for disease, as well as studies integrating genetic and neuroimaging data to identify risk factors and mechanisms of mental health disorders.

I'm particularly interested in the application of machine learning techniques to explore integrated data sets (genomic, clinical, and environmental data).


Ben Orwoll, MD, MS



- Pediatric Critical Care Physician at Doernbecher Children's Hospital
- Physician Informaticist for Pediatric and Neonatal Intensive Care
- Instructor for BMI 516: *Health Data Standards for Interoperability*
 - BMI 516 teaches the background and rationale behind health data standardization and covers some of the major highlights in terms of today's most frequently used standards
 - Special emphasis on FHIR

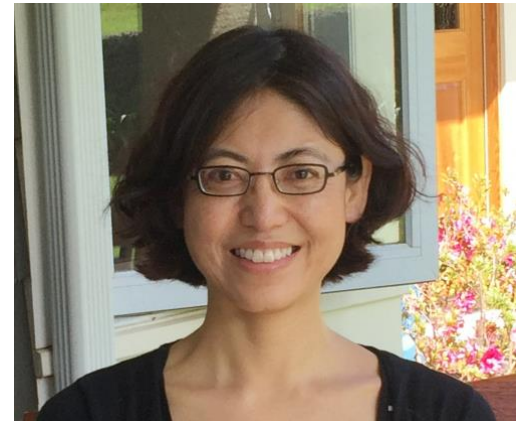
Ben Orwoll, MD, MS



- My research, quality improvement, and tinkering interests center around using clinical data to gain new insights and improve quality and standardization of care.
 - Integrating interoperable applications with the Epic EHR
 - Quality improvement in care of pediatric acute lung diseases
 - (near) Real time clinical and performance data displays
 - Advancing patient/family engagement and OpenNotes
 - Fluid and electrolyte management in the ICU
- I am interested in mentoring/collaborating with students to develop innovative new clinical tools using clinical data, advanced analytics, and  FHIR

Xubo Song, PhD

- Instructor for BMI 543:
Machine Learning
- Instructor for BMI xxx:
Introduction to Image Processing



- The Machine Learning course teaches the fundamentals of machine learning and covers key models and algorithms for supervised and unsupervised learning.
- The Image Processing course covers image processing principles and techniques with a brief introduction to machine vision.

Xubo Song, PhD

My research focuses on Machine Learning and Deep Learning. Specifically, we develop supervised and unsupervised algorithms and methods to extract information from biomedical data to gain insight into disease characterization, phenotypes, diagnosis and outcome prediction.

Much of my work has focused on Quantitative Imaging. We work with various biomedical imaging modalities, and develop image analysis algorithms for tasks including image segmentation, registration, characterization and classification, for domains including cancer, cardiology, and ophthalmology.



Joanne Valerius, PhD, MPH, RHIA

Assistant Professor

- Teaches: Managing Ethics in Biomedical Informatics
Offered Spring Term

Joanne Valerius, PhD, MPH, RHIA

Assistant Professor

- Research Interests:
 - Centers on human resource development in health care settings.
 - Focus is on a holistic approach to the workplace and how diversity impacts the workplace.
 - Practitioner perspective on the changes in HIM over the past 20 years.
 - International HIM and electronic health records



Joanne Valerius, PhD, MPH, RHIA

Assistant Professor

- Service Work/Research:
 - World Health Organization mobile app for International Classification on Functioning
 - WHO FDRG committee member
 - International Foundation ICF Charter Board Member

Nicole G. Weiskopf, Ph.D.

weiskopf@ohsu.edu

My research focus is on EHR data quality and data bias. My long term goal is to ensure that conclusions drawn from these data are valid and relevant for the patients of interest.

This includes:

- 1) Development and application of methods to assess data quality and bias
- 2) Investigations of upstream causes of these problems
- 3) Evaluation of downstream impacts on **patient care**, **quality of care measurement**, **data analytics**, and **clinical research**.

I use a mixed-methods approach, drawing from quantitative and qualitative methodology.

<https://www.ncbi.nlm.nih.gov/myncbi/nicole.weiskopf.1/bibliography/public/>

Nicole G. Weiskopf, Ph.D.

weiskopf@ohsu.edu

Examples of my current research include:

- Measuring and characterizing selection bias and data bias with respect to race and ethnicity in a very large clinically-derived COVID dataset. Part of this work involves an effort to understand drivers of missing race and ethnicity data so that we can improve these data.
- Application of causal inference methodology to understand role of patient social determinants of health in driving clinical data quality, with the ultimate goal of improving the reliability and validity of inferences based on these data, especially for underserved patients.

<https://www.ncbi.nlm.nih.gov/myncbi/nicole.weiskopf.1/bibliography/public/>

Nicole G. Weiskopf, Ph.D.

weiskopf@ohsu.edu

A few recent and forthcoming publications authored by student mentees and advisees:

Mishra M, Pickett M, Weiskopf NG. Using socio-technical context to understand the role of informatics in guideline implementation: Assessing risks from chronic opioid therapy in primary care. MedInfo 2021 Proceedings. Forthcoming.

Cook LA, Sachs J, Weiskopf NG. The quality of social determinants data in the electronic health record: a systematic review. JAMIA. Forthcoming.

Goueth RC, Cohen AM, Weiskopf NG. An Analysis of Two Sources of Cardiology Patient Data to Measure Medication Agreement. AMIA Annu Symp Proc. 2021;2021:267-275. eCollection 2021. PMID: 34457141; PMCID: PMC8378639.

<https://www.ncbi.nlm.nih.gov/myncbi/nicole.weiskopf.1/bibliography/public/>

Guanming Wu, PhD

Associate Professor

- ✓ Focusing on pathway- and network-based systems biology approaches for analyzing, visualizing and modeling omics data for cancer and other diseases
- ✓ Biological software and database development using state-of-the-art information technologies
- ✓ Project's web site: www.reactome.org



wug@ohsu.edu



Thank You