# Health Information Science Seminar Series



## Dr. John Holmes (Pens University)

### Explainable AI for the (Not-Always-Expert) Clinical Researcher

Wednesday, October 28, 2020

10:00 am - 11:00 am Pacific (Online via Zoom)

## Abstract

Armed with a well-founded research question, the clinical researcher's next step is usually to seek out the data that could help answer it, although the researcher can use data to discover a new research question. In both cases, the data will already be available, and so either approach to inquiry can be appropriate and justifiable. However, the next steps- data preparation, analytics, and inference- are often thorny issues that even the most seasoned researcher must address, and sometimes not so easily. Traditional approaches to data preparation, that include such methods as frequency distribution and contingency table analyses to characterize the data are themselves open to considerable investigator bias. In addition, there is considerable tedium resulting from applying these methods- for example, how many contingency tables does it take to identify variable interactions? It is arguable that feature selection and construction are two tasks not to be left only to human interpretation. Yet we don't see much in the way of novel approaches to "experiencing" data such that new, data-driven insights arise during the data preparation process. The same can be said for analysis, where even state-of-the art statistical methods, informed or driven by pre-formed hypotheses and the results of feature selection processes, sometimes hampers truly novel knowledge discovery. As a result, inferences made from these analyses likewise suffer. However, new approaches to making AI explainable to users, in this case clinical researchers who do not have the time or inclination to develop a deep understanding of how this or that AI algorithm works, are critically important, and their dearth represents a gap that those of us in clinical research informatics need to fill. Yet, the uninitiated shy away from AI for the very lack of explainability. This talk will explore some new methods for making AI explainable, one of which, PennAI, has been developed at the University of Pennsylvania. PennAI will be demonstrated using several sample datasets.

**Dr. Holmes** is a professor in the Department of Biostatics Epidemiology and Informatics and is the Associate Director of the Institute for Biomedical Informatics, Director of the Master's Program in Biomedical Informatics, and Chair of the Doctoral Program in Epidemiology, all at Penn. Dr. Holmes leads studies of novel analytic methods informed by statistics and artificial intelligence as they apply to interactions between people and environments in space and time. He is or has been a principal or co-investigator on projects funded by the National Cancer Institute, the National Library of Medicine, the Patient-Centered Outcomes Research Institute (PCORI) and the Agency for Healthcare Research and Quality. Dr. Holmes is engaged with the Botswana-UPenn Partnership, assisting in building informatics education and clinical research capacity in Botswana. He teaches courses in quantitative epidemiology, biomedical informatics, databases for clinical research, and machine learning and intelligent agents. Dr. Holmes is an elected Fellow of the American College of Medical Informatics (ACMI), the American College of Epidemiology (ACE), and the International Academy of Health Sciences Informatics (IAHSI).

**Join LIVE online:** https://uvic.zoom.us/j/94238877003?pwd=dzcvVUk4b1JJcnFYNHV0MWFSRUxlZz09
**Meeting ID:** 942 3887 7003 **Password:** 092096