Precision Phenotyping with Real-World Data: A Temporal AI Approach for Medicine

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Abstract: Hippocrates once stated, "It is far more important to know what person the disease has than what disease the person has." This reflects the critical importance of phenotyping—the process of identifying the unique characteristics of an individual affected by a disease—which is fundamental to clinical practice and drug development. The use of real-world data (RWD), including data derived from routine clinical care, holds immense potential to advance precision phenotyping. However, challenges such as data quality, consistency, and the reliability of raw clinical data present significant barriers. This presentation will explore how temporal information embedded within RWD can be harnessed to develop advanced precision phenotype models. These models not only enhance the accuracy of AI-driven predictions but also help to mitigate biases, ultimately contributing to more personalized and effective medical interventions.

Bio: Dr. Hossein Estiri is a computational scientist and faculty member at Harvard Medical School and the Massachusetts General Hospital's Department of Medicine. His research focuses on leveraging machine learning and artificial intelligence to analyze large-scale healthcare data, including real-world clinical data, for advancing precision medicine. Dr. Estiri's work emphasizes using data-driven approaches to improve patient outcomes, with a particular interest in phenotyping, healthcare disparities, and the application of temporal AI models in clinical settings. He has published extensively in the fields of biomedical informatics, machine learning, and health data science.