

Biomarker Discovery and Health Monitoring by Adaptive Integration of Heterogeneous Signals and Disease Knowledge

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Abstract: The emergence of big data facilitates a wider exploration of data-driven formulation from multiple longitudinal measurements that may reveal new insights into complicated health care systems. However, particular healthcare system characteristics present challenges that call for specialized techniques capable of integrating data, extracting intelligent knowledge and monitoring from multiple sensors. The statistical challenges for addressing the data-rich environment in many healthcare applications lay either in a complex data structure: e.g., multi-modality, longitudinal nature, and heterogeneity of patients, or it can lay in disease knowledge: e.g., Alzheimer's disease (AD), monotonicity, or in data-driven decision-making under uncertainty. In this talk, I will discuss our research approaches to analyze these challenges to handle healthcare data complexity. In addition, I will show how these models could be applied to some real-world applications, such as Alzheimer's disease research, surgical site infection and social signal processing.

Bio: Aven Samareh is a Ph.D. candidate at the Department of Industrial and Systems Engineering at the University of Washington, working with Professor Shuai Huang. Aven's broader research area is on knowledge-driven methodologies for disease trajectory modeling. Her research interest lie in the heterogeneity and healthcare decision making under uncertainty, mainly with a focus on the surgical site infection, Alzheimer's disease and mental health disease monitoring.