

Multimodal AI for Precision Health Across Pathology, Radiology, and Clinical Narratives

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Abstract:

Abstract: Precision health increasingly depends on turning heterogeneous clinical data into reliable, actionable signals. This seminar will present a multimodal AI framework that integrates three high-impact data streams: whole-slide pathology images, radiology imaging, and clinical narratives from the electronic health record. The talk will highlight representative use cases across cancer screening, diagnostic classification, risk stratification, and treatment planning, showing how foundation-model representations and task-specific adaptation can capture complementary information at tissue, organ, and patient levels. It will also discuss the practical and scientific challenges of real-world deployment. Across internal validation and external evaluation, these approaches show strong accuracy and generalizability across cancer types, imaging modalities, and health systems. The seminar will conclude with a roadmap for future work and collaboration, emphasizing rigorous evaluation and translational opportunities unlocked by fusing pathology, radiology, and narrative phenotypes to enable more precise, individualized care.

Reading list:

- [Wei, Jerry et al. "Generative Image Translation for Data Augmentation in Colorectal Histopathology Images." *Proceedings of machine learning research* vol. 116 \(2019\): 10-24.](#)
- [Nasir-Moin, Mustafa et al. "Evaluation of an Artificial Intelligence-Augmented Digital System for Histologic Classification of Colorectal Polyps." *JAMA network open* vol. 4,11 e2135271. 1 Nov. 2021. doi:10.1001/jamanetworkopen.2021.35271](#)