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Hong Kong develops AI pathology system for accurate multi-cancer diagnosis

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The research team plans to further enhance the systemâ??s diagnostic performance



A research team led by The Hong Kong University of Science and Technology (HKUST) has developed a pioneering artificial intelligence (AI) pathology analysis system, named PRET (Panâ??cancer Recognition without Example Training), that can accurately recognise multiple types of cancer using only a minimal number of samples—without requiring any additional training.

This breakthrough significantly enhances the flexibility and efficiency of AI-assisted medical care, marking a major step forward toward the widespread adoption of intelligent pathology.

The system is the first to introduce the concept of “in-context learning” from natural language processing into pathological image analysis. It allows the model to instantly adapt to new cancer types and perform diagnostic tasks, such as cancer screening, tumor subtyping, and tumor segmentation, during the inference stage by referencing only one to eight annotated tumor slides. Functioning as a "plug-and-play" intelligent diagnostic tool, PRET fundamentally overcomes the need for task-specific fine-tuning in traditional AI models.

Looking ahead, the research team plans to further enhance the system’s diagnostic performance and expand its applications to additional clinical tasks, such as genetic mutation prediction and patient prognosis assessment, opening up new directions for the future of AI-driven pathological diagnosis.