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Annotate Any Cell: a Platform and Framework for pathologist-guided AI-based cell annotation

AI-powered annotation platform accelerates and customizes digital pathology cell labeling with active learning.

Digital pathology and computational image analysis are useful tools for studying biological specimens in both research and clinical settings. However, current analysis systems are limited in usefulness due to issues like the methodology of feature detection (stain-based labels) or static annotation workflows. Pathologists currently manually identify cells and unusual features within biological samples, which takes lots of time and expertise to do well. To address these concerns, researchers at Purdue University have designed an AI-based pathology annotation system and method to help users dissect a sample more quickly and accurately than by manual annotation. The system is flexible and iterative due to the inclusion of machine learning models, and users can define, modify, and apply their own labels to individual cells or regions within the entire image, thus allowing for customizable annotations as well. This technology was designed to work with fixed and stained biological specimens but is currently being expanded to work on samples obtained from other imaging modalities like fluorescence imaging.

Technology Validation:

-Initial test case with bladder cancer whole-slide images to predict likelihood of patients to develop metastatic tumors based on output of technology

Advantages

-Faster analysis

-Does not require expensive hardware/equipment

-Customizable depending on user preference

-Can explore whole slide image space and cell level embedding space

Technology ID

2025-LANM-71206

Category

Biotechnology & Life Sciences/Bioinformatics & Computational Biology
Artificial Intelligence & Machine Learning/Computer Vision & Image Recognition
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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View online

-User labels challenging areas of whole slide image to help train model in active learning semi-supervised loop

Applications

-Digital pathology or other biological specimen computational image analysis in research or clinical settings

-Soon extended to fluorescence imaging and other imaging modalities

TRL: Medical/Health

Intellectual Property:

Provisional-Gov. Funding, 2025-07-18, United States

Keywords: AI, Computational Image Analysis, Computer Technology, disease diagnostics, Machine Learning, Medical/Health, Pathology