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Opinion Article

The Evolution of Digital Pathology in Medical Treatments

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DESCRIPTION

In the pathology field, where the use of Digital Pathology (DP) for primary diagnosis is becoming more and more frequent, the introduction of digitized Whole-Slide Imaging (WSI) technology has attracted considerable attention. In order to encourage the adoption of this technology, different government funds have been made available, and several pathology laboratories are currently entirely or partially digital. The recent Food and Drug Administration (FDA) approval of his WSI device for primary diagnostics has accelerated this. This paradigm shift in technology makes it possible to report remotely with flexible working hours, to provide continuous service even in trying circumstances like the COVID-19 pandemic, to report second and expert opinions, and to use artificial intelligence. Implemented are algorithms that are based on intelligence (AI).

An intricate multi-step procedure is required to digitize a whole glass slide, and it depends on the integration of cutting-edge scanner hardware, robots, and software. In addition to strong Quality Control (QC) procedures beginning with the receipt of the specimen and continuing through fixation, processing, and slide preparation prior to the actual scanning process and acquisition of the WSIs, producing the highest quality WSIs also depends on the abilities of a skilled operator who directs the scanning procedure. The adoption of DP in routine practice for making an accurate diagnosis and sharing challenging cases for a second opinion depends critically on the representation of the tissue within the WSI compared to the corresponding glass slides. However, it is unlikely that pathology laboratories will stop storing glass slides and start relying on the archived digitized WSI unless there is evidence-based assurance that WSI is fully representative of the corresponding glass slides. Archiving both glass slides and WSIs in routine practice is not cost effective and will require additional resources. Such evidence (or evidences) ought to be convincing enough to alter national regulations. Additionally, it would be ideal for scanner manufacturers to offer quick, high-throughput scanners capable of handling the volume of slides produced by contemporary laboratories while maintaining the image quality in order to facilitate slide scanning on a large scale in routine histopathology reporting. This calls for a largely automated scanning procedure, and it is crucial that this automation prevents scanning errors caused by low-density tissue missing, like adipose tissue. In this investigation, we sought to determine the therapeutic relevance of the digitized WSI representations by comparing them to the equivalent glass slides. As a model for adipose tissue, histopathological WSIs from diverse breast lesions were employed. Due to its low contrast and pale character, which presents a range of clinical abnormalities and tissue densities, this tissue poses the most scanning challenges. This was examined using various breast specimen types and scanning protocols, highlighting the function of quality control measures in reducing these dangers.

Numerous functions of the online paraphrasing tool include rewriting essays, eliminating plagiarism, and rewording articles. As a word changer, our paraphrasing tool performs well. In our investigation, we found a negative relationship between scan time and image file size and the frequency of missing tissue. The largest incidence of missing tissue was seen in scanners without human interaction during scanning because they tended to neglect weak tissue during scanning in order to accelerate the process. These scanners also had shorter scan periods. In conclusion, different frequencies of missing tissue in breast WSI have been reported. Adipose tissue is frequently disregarded and has limited diagnostic use. The scanning algorithm can be strengthened to perform better and be more accepting of sliding edges, which would boost user acceptance of the technology. Trade-offs between WSI quality and scan time/image file size must be taken into account. Like with the creation of glass slides, appropriate QC procedures can lower the error rate of WSI and lower the possible clinical effects of missing tissue on WSI.

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