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  Visual perception and biomedical image analysis

  Many studies have discussed the advantages of using quantitative techniques in the analysis of histopathological images used in the diagnosis of colonic cancer. Although these methods have led to significant advances in the development of automated techniques, manual processing by a clinical expert remains the standard against which results are assessed. While clinical expertise is essential in diagnosing subtleties of this disease, to a certain extent, gross changes in form associated with disease progression are apparent even to the untrained eye.Building on previous work on the use of computational models of low- level visual processes in the analysis of biomedical images, I will discuss our attempts to exploit mechanisms based explicitly on human perception in the classification of colon images. I will also describe our plans to investigate analytical differences between expert and untrained pathologists through image similarity studies, and consider the implications of this work in relation to both the classification problem and the training of clinicians.

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