Final Report

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3rd Year Individual Project

I certify that all material in this thesis that is not my own work has been identified and that no material has been included for which a degree has previously been conferred on me.

Signed.....Jiaqi Yao.....

College of Engineering, Mathematics, and Physical Sciences
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Final Report

ECM3175/ECM3149

Title: Exploratory Deep Learning Models: Determining Optimal Cutting Parameters for a Microtome

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Abstract

This study investigates optimizing biopsy parameters through deep learning, utilizing the InceptionV3 model via transfer learning for assessing the quality of biomedical tissue sections. Experiments with various cutting angles identified optimal parameters that significantly improved tissue section quality. Additionally, image preprocessing studies showed that using original image data often resulted in better outcomes than using processed images. The research suggests further expanding classification methods, enhancing performance, investigating additional influencing factors, and dynamically adjusting slicing parameters. These proposals aim at developing fully automated histology instruments. The findings confirm the model's adaptability to various tissue types, highlighting its potential as a versatile tool in histopathology.

Keywords: Deep Learning Tissue Sectioning Transfer Learning InceptionV3