Classification of Prostate Tissue Images using Artificial Neural Network

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The exponential growth in use of automated system and increasing research for various methods to analyze is a challenge, due to its diverse image features and diagnosing methods in different fields of medical requiring different system for diagnosing, thus put a lot of constraints in using one tool for all, hence difficulties to create a generalized image processing and analyzing tool, for medical image analysis.

Medical image processing major benefit is that it is time and cost efficient which is the most important resource for diagnostics experts such as radiologists or pathologists, as they can utilize somewhere much more important. With recent advancements in medical image processing we can now approach medical diagnosis with computational power and advanced processing techniques which can efficiently and effortlessly perform tasks. In this research, medical images of prostate cell tissue of H&E stained images were acquired and analyzed by training artificial neural networks by using self-organizing maps which uses un-supervised learning algorithm to classify the affected cell tissue and healthy cell tissue. The approach and methodology implemented gives the accuracy score of 84% and precision score of 90% for our neural network model.

This can be used as a diagnostic tool for experts to have a second opinion on diagnosis, and faster image manipulation techniques can save experts ample amount of time. In this work, a potential solution for the problem of big data especially in medical images is presented using computer vision library, thus showing the potential of AI-based and deep learning techniques which are one of the way for diagnosis.