Reflection Report

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Problem analysis and methodology

The aim of the CADx research group is to classify ovarian cancer tumors into benign, borderline, and malignant. Implementation of computer aided diagnostics (CADs) in the medical field poses unique challenges compared to other AI implementations. Among others the challenges include:

- The resolution of the medical images is constantly changing over time as new methods are explored and existing methods are improved upon. The size of the images is also quite large since this is desired for quality of the images.
- The images are not openly available, due to the privacy constraints in healthcare it is not possible to share the data. This leads to a very small amount of data available. It also means that the data is not strictly similar since the images are acquired with different machines in different hospitals.

How the research aims to solve the problems is through data pre-processing and using support vector machines (SVMs) in combination with 2D convolutional neural networks (CNNs) to classify the tumors. The data is processed from 3D to 2D images to reduce the size of the images to keep the inference time low. The SVM implementation is a robust method to aid in classification tasks with a limited amount of data. Pre-trained CNNs are used since they are trained on a large amount of data and can apply this knowledge onto the ovarian cancer data.

Results and conclusions

The study would benefit from comparison to 3D feature extraction. In the paper it is speculated that there will be a large increase in inference time since the size of the input is much larger. It would be very interesting to compare the results from a 3D feature extraction to the results of the paper since then it would be possible to draw conclusions on what method to explore further.

All results are cross validated to prevent overfitting which assures a representative result for potential new data. Furthermore, all methods considered in the paper are evaluated exactly similar which means they can be compared to each other.