Region Force Based model for Brain Tumour Segmentation on T2 MRI

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Objective

- In medical imaging, selective segmentation allows precise analysis of anatomical data by isolating certain structures, such as Tumour detection, segmenting the hip or knee for implant design.

- In this work, we combine features from new region force term and geodesic distance penalty term in single selective segmentation framework to segment Tumours on MRI T2 images.

Method

Purposed Model = Region Force Term + Regularisation Term + Distance Term

$$F(\phi_1, c_1, c_2) = min_{0\leq\phi_1\leq 1, \phi_1\in S} \int_\Omega \mu[p2 - p1]\phi_1 dx + \int_\Omega \alpha(x)|\nabla\phi_1|dx + \theta\int_\Omega D_g(x,y)\phi_1 dx$$

- The above Model is applied on an input Image with prior information of marker set.

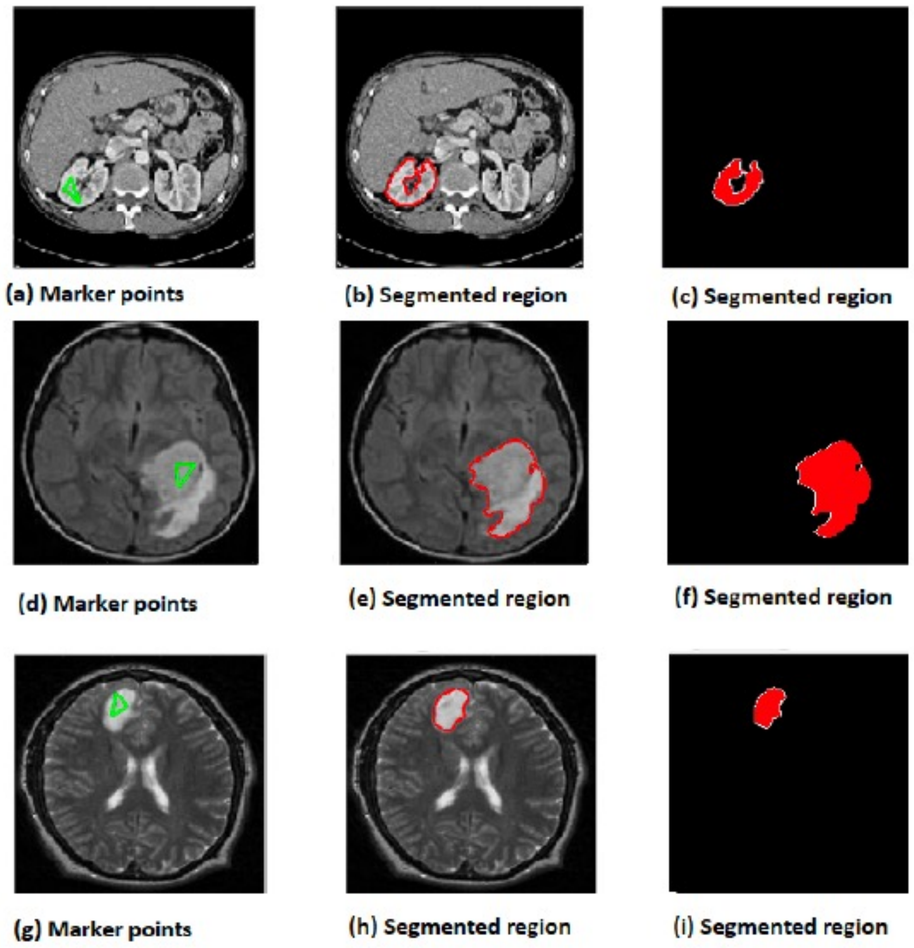
- The output achieved is the segmented solution after passing on an input Tumour image to the above Model.

Conclusion

- Utilizing the purposed segmentation model in clinical workflow can help clinicians to identify the spatial location of Tumours.

- The purposed algorithm can be considered as a substitute for label-intense manual Tumour delineation task which requires a significant amount of time and experienced clinicians.

Results



References

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