

Automated Stroke Lesion Localization and Segmentation Using Deep Learning - Project Proposal

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SUMMARY

Localization of lesions in stroke patients plays a vital role in the diagnosis and treatment of stroke. In this project, we propose to use deep learning to automatically localize and segment lesions in stroke patients. We will use five different deep learning architectures to perform this task.

BACKGROUND

Early localization of lesion plays a vital role in prediction of the final infarct volume and the clinical outcome of the stroke patient. As demonstrated in [1], growth of the lesion volume during the initial MRI screenings, demonstrates a strong correlation with the final infarct volume.

PLAN

Our plan is to gather data from our locally sourced dataset, as well as data from the ISLES 2022 challenge. We will then preprocess the data and train our five models on the data. We will then evaluate the performance of our models using the Dice coefficient as well as a five-fold cross validation. We will also compare our models to the state-of-the-art models from the ISLES 2022 challenge.

CONCLUSION

Early prediction of final infarct volume can be vital in life-saving clinical decisions. Our project can help clinicians make these decisions, as well as aid researchers to better understand the progression of stroke lesions in reference to additional factors such as gender, age, and time.

REFERENCES

- [1] LESK, M., AND KERNIGHAN, B. Computer typesetting of technical journals on UNIX. In *Proceedings of American Federation of Information Processing Societies: 1977 National Computer Conference* (Dallas, Texas, 1977), pp. 879–888.