

BET-GAN

Unsupervised-learning approach for automatic CT brain extraction trained using synthetic MRI scans

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BACKGROUND

Brain extraction is the removal of non-brain tissues and artificial objects. Brain extraction is a necessary pre-processing step for a wide variety of classical and deep learning techniques for medical use such as – Haemorrhage and acute infarct detection; Brain tissue and structural segmentation; Inter- and intra- modality image registration. Currently, there is extensive research done on MRI brain extraction as MRI can typically capture clearer and more detailed images of brain tissues.

Removal of non-brain tissues

- Skull, Scalp, Eyes, Nose

Removal of artificial objects

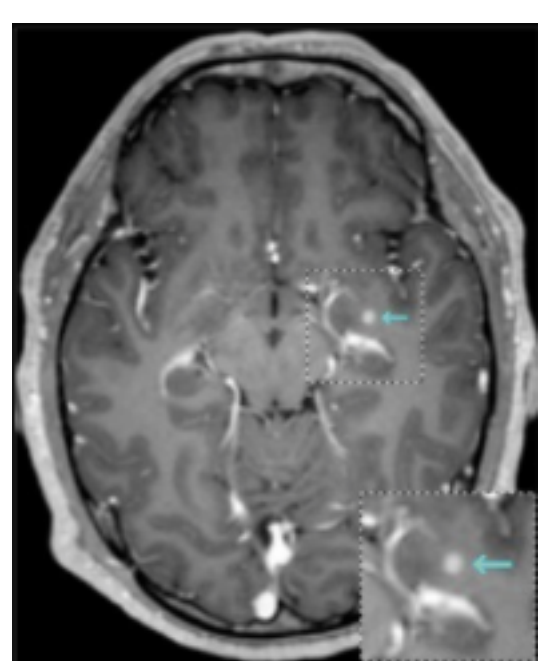
- Head Support, External medical devices



OBJECTIVE

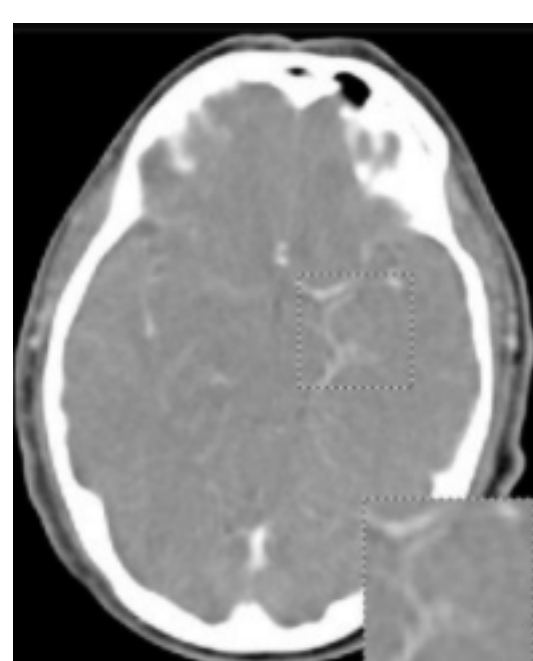
We aim to automate CT brain extraction to eliminate manual labour and enhance treatment time in emergency medical situations.

PROBLEM STATEMENT



MRI

- Up to 1 hour

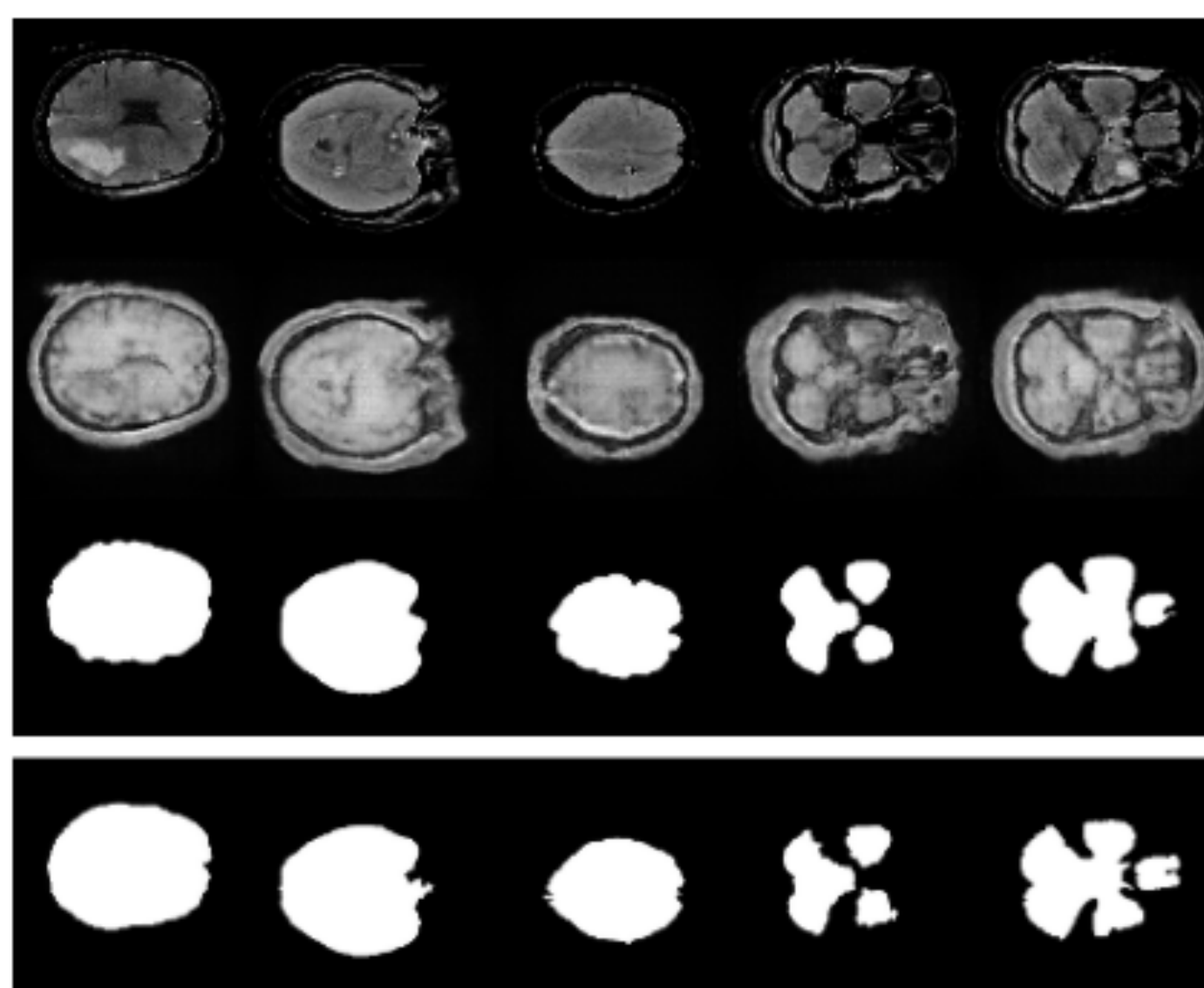


CT

- 10 minutes

MRI scans can take significantly longer compared to CT scans. This makes the use of MRI scans unsuitable for time-critical situations such as medical emergencies.

RESULTS



Real CT slice

Synthetic MRI slice

Generated brain mask

Ground truth brain mask