

IBBM Project Proposal: Master thesis

Transformer-Based Regression Model for Metabolite Quantification in MR Spectroscopic Imaging

Keywords

Transformer; Magnetic Resonance Spectroscopy; MRSI; Quantification

Abstract

MRS data is composed of 1D spectra that can quantitatively characterize the metabolic composition of *in-vivo* tissue. This is especially useful for characterizing brain tumors. The primary drawback to this data type is the extensive and costly pre-processing and analysis necessary to prepare and annotate the data. Attempts to accelerate this work using deep learning is a budding, active research field.

Transformers were initially developed for NLP tasks. However, recent research has shown them to be highly effective for image classification in computer vision as well. Due to the spatial nature of MRS data, CV CNN models have been effective for this quantification task. Therefore, we would like to explore the use of transformers to assess their potential for this computer vision-based regression task.

Required Skills

- Proficient with PyTorch
- Experience with Transformers and Computer Vision

What we expect from you

We are looking for a **highly-motivated student** with an above-average academic track record. You should have a technical background including data analysis and machine learning, good problem solving skills, and **be able to work independently**.

What we offer you

You will receive **strong support** to make your thesis a success. You will gain experience working with a unique, specialized data type from an international collaboration. Successful completion of this project will give you a good chance at **co-authorship** on a high-profile **journal publication**.

If you are interested, please send a CV, transcript, and letter of motivation to jlamaste@gmail.com.



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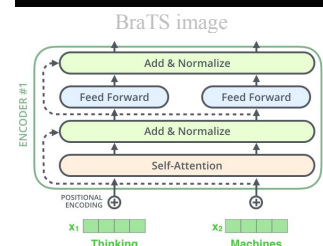
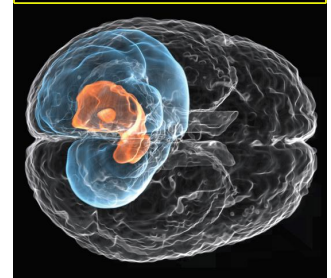
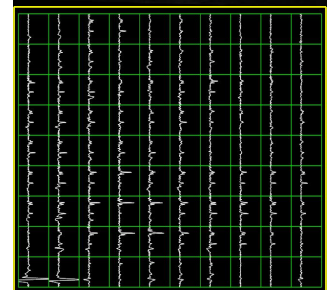
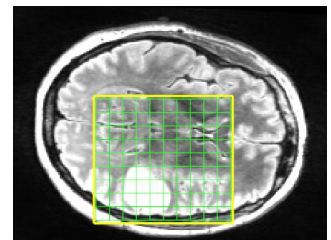
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