

Master Thesis Proposal

Digital Health Center – Chair Machine Learning & The Hasso Plattner Institute for Digital Health at Mount Sinai

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What's in the image? Exploring target EHR variables from Clinical Brain MRI

This project involves the use of deep learning to explore EHR variables that can be predicted from corresponding Brain MRI scans. Besides the diagnosis, variables such as prognosis and medications have clinical value to guide decision support, others such as demographics are of informative interest. A potential method for this project is multi-task learning, where one tries to predict several variables in parallel to save modeling time and make use of commonalities within the data. The dataset stems from both the Mount Sinai Imaging Research Warehouse and Mount Sinai Data Warehouse and contains more than 10.000 patients, MRI scans from multiple modalities (e.g. T1/T2) and EHR data such as ICD codes, medications, lab values, procedures and demographics. Since this dataset is a dump from day-to-day clinical work, it will be diverse and contain various condition types. Familiarity and prior experience with data analysis, deep learning and in particular convolutional neural networks, as well as experience in either of the major deep learning frameworks are good prior experiences for this thesis project. Lastly, you should feel a drive to both learn about medical imaging and to identify clinical variables that were unknown to be visible in Brain MRI scans.