Vision Language Models for Patient Retrieval in Radiation Therapy

Pattern Recognition Lab

FAU

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Motivation

In clinical practice, retrieving medical records of similar patients can offer valuable insights, particularly for those patients with rare or uncommon conditions. In the field of radiotherapy, it is common to consult reference cases when dealing with uncommon tumor location to look for reference cases to guide the treatment planning. Even for more common diseases or tumors, being able to efficiently query existing patient databases is crucial for understanding treatment efficacy within subgroups that closely resemble the current patient.

Thesis

This master thesis would explore the application and finetuning of existing Foundational Models based on Vision-Language Models specific for the application of patient-retrieval in the context of radiotherapy.

Work packages:

- Explore existing models for patient retrieval with special focus on clinical resource constraints

- Setup evaluation of patient retrieval specific to the radiation therapy requirements

- Extend and finetune existing models trained on CT or MR

Relevant Literature:
Zhao Z, Jin Q, Chen F, Peng T, Yu S. A large-scale dataset of patient summaries for retrieval-based clinical decision support systems. Sci Data. 2023 Dec 18
Blankemeier, Louis, et al. "Merlin: A vision language foundation model for 3d computed tomography." Research Square (2024): rs-3.
Hamamci, Ibrahim Ethem, et al. "Developing generalist foundation models from a multimodal dataset for 3d computed tomography." arXiv preprint arXiv:2403.17834 (2024).