CT-Scan Cancer Detection

This project aims to develop an AI model that can detect cancer from CT scans.

Last Change: 22 Oct 2023 Dev Thakkar

High-Level Explanation:

The project will use deep learning techniques to train an AI model to detect cancer from CT scans. The model will be trained on a dataset of CT scans that have been labelled as either cancerous or non-cancerous. The model will then be able to identify cancerous regions in new CT scans with high accuracy.

This project must be an AI project because it requires the use of advanced machine learning techniques to accurately detect cancer from CT scans. Traditional methods of detecting cancer from CT scans are time-consuming and require a lot of manual effort. An AI model can automate this process and provide faster and more accurate results.

Success Criteria:

The minimum viable product for this project should include the following features:

- **A dataset of labelled CT scans**
- **A deep learning model that can detect cancer from CT scans with high accuracy**

Extensions:

- **A user interface that allows users to upload new CT scans and view the results of the cancer detection algorithm**
- **Applicability to other diseases, e.g. strokes, etc.**

Resources Required:

Data: A dataset of labelled CT scans is required for training the deep learning model.
Software: Deep learning frameworks such as TensorFlow, PyTorch, or Keras are required for building and training the deep learning model.
The following roles are needed for this project:

- **(OPTIONAL) UX Designer: Responsible for designing the user interface that allows users to upload new CT scans and view the results of the cancer detection algorithm.**
- **Software Engineers: Responsible for building the deep learning model and integrating it with the user interface.**

- **Machine Learning Engineers: Responsible for training and fine-tuning the deep learning model.**

Proposed Architecture:

The proposed architecture for this project involves using a deep learning model to detect cancer from CT scans. The model will be trained on a dataset of labelled CT scans using deep learning frameworks such as TensorFlow, PyTorch, or Keras. The model can then be integrated with a user interface that allows users to upload new CT scans and view the results of the cancer detection algorithm.

Alternatives Considered:

Alternatives considered for this project include using traditional machine learning techniques such as decision trees or support vector machines to detect cancer from CT scans.

Stretch goals for this project could include developing a mobile application that allows users to take pictures of CT scans and receive real-time feedback on whether they contain cancerous regions. Out-of-scope items could include developing a web application that allows users to view statistics on cancer rates in different regions.

Training Resources :

Please provide some resources that would provide some resources that would help a potential team onboard the project. (Research / Documents / Videos / Websites)
Artificial intelligence is improving the detection of lung cancer (nature.com)
Using artificial intelligence (AI) to help radiologists with CT scans - Case study - GOV.UK (www.gov.uk)
Learn About Cancer Data Science | CBIIT
AI could improve cancer diagnosis – if we get these 5 things right - Cancer Research UK - Cancer News

NIH issues huge database of CT scans for AI testing – Physics World
Chest CT-Scan images Dataset (kaggle.com)
NIH Clinical Center releases dataset of 32,000 CT images | National Institutes of Health (NIH)
Deep Learning for Lung Cancer Detection on Screening CT Scans: Results of a Large-Scale Public Competition and an Observer Study with 11 Radiologists | Radiology: Artificial Intelligence (rsna.org)

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