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Title: Midterm Progress Report - Brain Tumor Detection

Date: 03.13.2024

Accomplishments:

1. Data Collection and Preprocessing:

- Collected the dataset of brain tumors, that have (Yes tumor, No Tumor)
- Preprocessing data, including converting images to grayscale, resizing to 64*64 pixels, and normalization
- Looking for bigger data to use in the project, for deep learning purposes.

2. Data Visualization and understanding

- Exploratory data analysis of the Brain Tumor data, understanding medical image dimensions for classes (NO tumor, YES tumor), outliers and diversity of data in graphs.
- Understanding Pixel intensity, differences between classes intensity and why? analysis.

3. Data Augmentation

- After resizing, and normalization of data, preprocessing of data in general, data augmentation comes.
- Applied data augmentation techniques such as rotation, width, and height shifting to enhance the dataset and improve model generalization.
- Data augmentation may help in producing noisy data thorough out training to make a better training of data and accuracy.

4. Model development

- Implemented traditional machine learning models, like SVM, and random forest. With random forest being the best accuracy in data after many experimental trials in both machine learning models.
- Designed CNN architecture with three layers (batch normalization, max pooling, dropout) to prevent overfitting was used.

5. Training and evaluation

- Training of data using CNN architecture.
- Looking for best techniques to increase accuracy for the deep learning, after going through a lot of problems aiming for best accuracy.

Reminding Tasks:

- Best accuracy for model to be achieved
- Model Debugging
- Web Development
- Integration with ChatGPT API
- Final adjustment to the code
- Final Adjustments to the web interface

Plan:

- Week 7(03.11.2024): Model accuracy, model debugging and fixing errors.
- Week 8(03.18.2024): Web development using best practices considering my final model.
- Week 9(03.25.2024): Integration with ChatGPT API, testing, and addressing any issue identified through testing to resolve.
- Week 10(04.01.2024): Final adjustment to the code.
- Week 11(04.08.2024): Final Adjustments to the web interface and final presentation.
- Week 12(04.15.2024): Final adjustments to the project and presentation preparation.