UPSCHOOL MACHINE LEARNING & DEEP LEARNING PROGRAM

IN PARTNERSHIP WITH GOOGLE DEVELOPERS

**LOW-GRADE GLIOMA SEGMENTATION**

**Project Proposal**

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# Description of Available Data

* The Brain MRI segmentation dataset is obtained from [The Cancer Imaging Archive (TCIA)](https://wiki.cancerimagingarchive.net/pages/viewpage.action?pageId=5309188) via [Kaggle](https://www.kaggle.com/datasets/mateuszbuda/lgg-mri-segmentation?datasetId=181273).
* The dataset contains brain MR images together with manual FLAIR abnormality segmentation masks.
* They correspond to 110 patients included in The Cancer Genome Atlas (TCGA) lower-grade glioma collection with at least fluid-attenuated inversion recovery (FLAIR) sequence and genomic cluster data available.

# Planning the Project Process Part

* These stages are planned to be done in order
  + Data Preparation
  + Data Visualization
  + Data Augmentation (if necessary)
  + One or both of these will be used for the modeling part. All three can be used for comparison. (Still being researched.)
    - U-net
    - ResNet
    - FPN (Feature Pyramid Network)
  + Comparison of Different Models
  + Writing the report on the project

# Related Articles

* [Association of genomic subtypes of lower-grade gliomas with shape features automatically extracted by a deep learning algorithm](https://arxiv.org/pdf/1906.03720.pdf)
* [Radiogenomics of lower-grade glioma: algorithmically-assessed tumor shape is associated with tumor genomic subtypes and patient outcomes in a multi-institutional study with The Cancer Genome Atlas data](https://pubmed.ncbi.nlm.nih.gov/28470431/)
  + Both articles were written using this data.

# Why did I choose this data?

I chose this dataset because I took courses on neuroscience and artificial intelligence, and because I wanted to continue my career as an artificial intelligence engineer, machine learning engineer, or data scientist in the health sector, I chose this dataset because I thought it would be training for me before hiring.