**VISHWAKARMA INSTITUTE OF INFORMATION TECHNOLOGY, PUNE**

**COMPUTER ENGINEERING DEPARTMENT**

**APRIL-MAY 2018**

**Synopsis**

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**Group number:**

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**Title: Prediction of survival rate for patients with brain tumor using radionomic features and machine learning.**

**Objective :** The aim of the project is to predict the survival rate of a patient with glioma(brain tumor) in the functional MRI images using features obtained from fMRI images and machine learning approaches.

**Abstract :** Accurate prediction of overall survival rate for patient with gliomas is required for evaluating therapy priority, monitoring tumor growth in affected patients. For the prediction of survival rate in patients with gliomas, we aim to use features from the fMRI images and Machine Learning algorithms like SVM, Random Forest etc to classify patient into one of three labels- long survivors( e.g. >15 months), short survivors(e.g. <10 months) and mid-level survivors(e.g. between 10 to 15 months).

**Briefs about Contents:**

1. **Introduction :** The topicmakes use of Machine learning and features from fMRI images to predict the overall survival rate of a patient with brain tumor. Different types of Machine learning algorithms like SVM, Random Forest, Gradient Boosting etc. will be used for the approach and the best algorithm will be used for the classification of patient based on their fMRI image.
2. **Technical Details :** The application will be written in Python, with occasional analyses done in R using oro.nifti package. Machine learning methods like SVM, Random forest, along with novel methods like SpaceNet classification will be used.
3. **Working :** The algorithm will train on the training data and provide a label for overall survival to test data. These labels will tell us about the overall survival of a patient with glioma.
4. **Applications:** This topic can help doctors and radiologists in hospitals to better classify patients according to their overall survival and help assign priority for treatment of a patient with glioma and help doctors in monitoring tumor growth in patients with serious conditions.

**References/Bibliography:**

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