

## Capstone Three: Project Proposal- “Breast Cancer Diagnosis using Image Processing and Deep Learning”

*Student: Youssaf Menacer*

*Mentor: Tony Paek*

*Our project aims to address the crucial problem of classifying cancer MRI images into two classes: pCR (pathological complete response) represented by label 0, and non-pCR represented by label 1. The significance of accurate classification lies in assisting medical institutions and research organizations in assessing patient responses to cancer treatments. By developing a neural network model, we intend to automate the classification process, saving valuable time for healthcare professionals and enabling them to devise personalized treatment plans based on the model's predictions. This endeavor can potentially improve patient outcomes and optimize healthcare practices through advanced image analysis.*

*Our client for this project is a medical institution or research organization invested in cancer diagnosis and treatment. They highly value accurate image classification to make informed patient care and treatment strategy decisions. The automated classification provided by the neural network model will offer efficiency gains for medical experts, allowing them to prioritize critical cases and tailor treatments based on the model's predictions. We will acquire the necessary data from a Kaggle [dataset](#) containing MRI images and their corresponding class labels, and preprocess the images to prepare them for neural network training. Utilizing deep learning techniques, particularly Convolutional Neural Networks (CNNs), we will design a model capable of accurately predicting the class probabilities of MRI images. The model will undergo thorough evaluation using metrics like accuracy, precision, recall, and F1-score to ensure its effectiveness. By providing code, a comprehensive report, and a slide deck presenting key findings and potential applications, our deliverables will contribute to the medical community's efforts to advance cancer diagnosis and treatment planning through innovative image classification solutions.*