CSCE 5222 - Feature Enginerring
Project Proposal
Title: Skin Cancer Prediction

- **Team members -**
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- **Idea Description -** We are trying to classify the 7 different types of lesions from the SKIN CANCER MNIST Dataset.

- **Goals and Objectives -** To successfully predict the type of cancerous lesion from a photo of a person's affected body part.

- **Motivation -** The human body's largest organ, the skin, has a surface area of about 20 square feet. The primary functions of the skin are to assist the body control temperature, shield internal organs from bacteria and UV rays, and allow for perspiration, touch, heat, and cold feelings. Skin cancer incidence has been sharply rising in recent years. Melanoma is the most common cause. According to the World Health Organization, there were an estimated 232,000 documented cases of skin cancer worldwide. Additionally, it has been reported that the age difference and rate both rise globally each year. Therefore, it's crucial to start treating at an early stage since there is a significantly better probability of long-term survival.

- **Significance -** One of the most serious types of cancer is skin cancer. Unrepaired DNA breaks in skin cells, which result in genetic flaws or mutations on the skin, are the primary cause of skin cancer. Because skin cancer is more treatable in its early stages and has a tendency to gradually spread to other body areas, it is best identified at an early stage. Early detection of skin cancer symptoms is necessary due to the rising incidence of cases, high death rate, and expensive medical treatments. Given the gravity of these problems, researchers have created a number of early-detection methods for skin cancer. Skin cancer is detected and benign skin cancer from melanoma is distinguished using lesion features including symmetry, color, size, form, etc.

- **Literature Survey -**
  - **Skin Cancer Detection: A Review Using Deep Learning Techniques -** Different neural network algorithms for skin cancer detection and classification have been covered in this systematic review research. These methods are all non-invasive. The method of detecting skin cancer involves several steps, including preprocessing, image segmentation, feature extraction, and classification. The classification of lesion images using ANNs, CNNs, KNNs, and RBFNs was the main emphasis of this review. Each algorithm has benefits and drawbacks. The key to getting the best results is choosing the classification method correctly. However, because it is more closely tied to computer vision than other neural networks, CNN performs better than other types of neural networks when classifying picture data.

  - **A Survey On Diagnosis Of Skin Cancer Based On Image Processing Using Machine Learning -** Skin lesion diagnosis techniques integrated inside eHealth apps that support individuals and medical professionals are clearly needed as the prevalence of skin cancer rises. Melanoma is the most serious type of skin cancer, with an extremely poor chance of survival. Melanoma early identification may increase survival rates. This study provides a concise overview of how skin cancers function and are detected by many researchers, which is helpful for classifying normal and malignant skin cells.

- **Objectives -** To accurately identify the type of cancer by carefully analyzing the photo of the lesion. We are attempting to distinguish between the many features in a snapshot of a cancer lesion in order to develop a model that will successfully classify them.

- **Features -** We will be primarily working with images and we will be features from the lesion on the skin from the photos of people as well as age, gender, and place of lesion from the dataset.

- **Expected Outcome -** Successfully classify type of cancer with a good accuracy.

- **References -**
  - Dataset
  - Skin Cancer Detection: A Review using Deep Learning Techniques
  - A Survey On Diagnosis Of Skin Cancer Based On Image Processing Using Machine Learning