**Project Ideas for Capstone Three**

**Project-1**

Classifying the math symbols from the images of handwritten symbols.

*Data Source: -* <https://www.kaggle.com/xainano/handwrittenmathsymbols?select=data.rar>

*Dataset Information: -*

Total no. of Images: 3,75,974

Total no. of Classes of symbols: 82



*Brief Description on methodology: -*

As per the discussion on Kaggle the dataset contains the repeated examples i.e. images are exact match pixel by pixel. The first approach would be to delete those repeated examples and down sample the instances (may be 100 per class). Then to use the deep learning image processing algorithms like CNN with hyper parameter tuning to classify the images correctly. This is an image classification problem and the detailed methodology will be finalized during the implementation of the problem. This could be a good business problem where a software can be developed in which the researcher or professor writes on a piece of paper and the same can then be converted to research paper or notes quickly.

**Project-2**

Predicting the structural integrity of the structure using surface crack detection.

*Data Source: -* <https://www.kaggle.com/arunrk7/surface-crack-detection>

*Dataset Information: -*

Total no. of Images: 40000

Total no. of classes: 2

 

*Brief Description on methodology: -*

Based on the images the problems aims at classifying the cracks in surface of concrete. Both the classes consist of 20000 image each and we will use an optimize no. of images for training that is within our computational limits. The methodology will be to use the deep learning image processing algorithms like CNN with hyper parameter tuning to classify the images correctly. This is an image classification problem and the detailed methodology will be finalized during the implementation of the problem. This model could be used by civil contractors, government agencies for the inspection of newly built structures or for the inspection of already built structures due for maintenance.

**Project-3**

Recognition of letters and numbers from the image of sign language gesture.

*Data Source: -* <https://www.kaggle.com/ahmedkhanak1995/sign-language-gesture-images-dataset>

*Dataset Information: -*

Total no. of Images: 55500

Total no. of classes: 37



*Brief Description on methodology: -*

The idea is to classify the images of sign language to letter and numbers. In total there are 55500 images but the around 100 per class will be used for training. The methodology will be to use the deep learning image processing algorithms like CNN with hyper parameter tuning to classify the images correctly. This is an image classification problem and the detailed methodology will be finalized during the implementation of the problem. This model could be used in the medical industry for creating a software which can bridge the communication between hearing impaired person and person with no knowledge of sign language.