# SHREYAS HR

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## Education

**M.Tech. in Computational and Data Science**                                          **2022 – 2024**
*Indian Institute of Science, Bangalore*                                                          *CGPA:7.4*

**B.E. in Information Science**                                                                   **2018 – 2022**
*RNS Institute of Technology*                                                                        *CGPA:7.9*

## Projects

**Class Activation Map-based Weakly supervised Hemorrhage Segmentation using Resnet-LSTM in NCCT July 2023**

- Proposed a weakly supervised method for hemorrhage segmentation in NCCT scans using ResNet-LSTM and CAM to capture spatial contextual information across slices.
- Obtained pseudo-label masks for segmentation by using CAM to generate a weak prior of hemorrhage location and applying K-means clustering to obtain clusters.
- Trained a 3D U-Net model in a supervised manner using the obtained pseudo-label masks and a combination of BCE and Dice loss.
- Previous weakly supervised methods often treated all slices equally, neglecting the valuable spatial context provided by 3D information. So, our project considered 3D information across slices of a scan(subject) and provided comparable results with the Fully-Supervised U-Net Model. View Paper

**Implementation of CycleGAN to Convert CT Hemorrhage Dataset to MR Hemorrhage Dataset          May 2023**

- Implemented a CycleGAN, for unpaired image-to-image translation, in the domain of medical imaging to generate MR T2 images from CT scans.
- Introduced neighboring slices as input to the CycleGAN, resulting in improved consistency and coherence in the translated MR images.
- A use case of this work is getting a CT scan of a subject without subjecting them to radiation or serving as a benchmark for an actual CT scan.

**Comparative Analysis of Supervised Contrastive Loss and Cross-Entropy Loss for Image Classification June 2023**

- Implemented Contrastive Learning for classification.
- Evaluated the performance of both Supervised Contrastive Loss and Cross-Entropy Loss in the context of image classification.

**Improving SDH type Hemorrhage Classification and enhancing CAM Using spatial and channel attention September 2023**

- Classification of SDH type Hemorrhage by including Spatial and Channel attention in each Convolution Block of ResNet architecture.
- Included both spatial and channel-wise attention which improved the accuracy and enhanced the Class Activation Map.

**Implementation and Analysis of Vision Transformer (ViT) for classification                      March 2023**

- Implemented a basic version of Vision Transformer (ViT) with multiple layers and multi-head attention and analysed with different number of attention heads, different patch size embeddings and classification token from different layers.

## Technical Skills

**Programming Languages**: Python,C, C++, SQL
**Tools**: Pytorch, Numpy, Sci-kit Learn
**Technical**: Machine Learning, Deep Learning, Computer Vision, Medical Image Analysis, Image Processing

## Relevant Coursework

- Deep Learning for Computer Vision
- Machine Learning
- Advance Image Processing
- Linear Algebra
- Numerical Optimization
- Artificial Intelligence for Medical Imaging[*1]
- Probability and Statistics

## Academics & Extra Curricular Achievements

- Secured AIR 94 in GATE-CSE 2022
- Secured AIR 943 in GATE-CSE 2021(in 3rd year)
- Participated as student volunteer in UNNAT BHARAT ABHIYAN

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[1]Ongoing