

- Names: Andrea Camilloni, Chetan Reddy, Raghav Singhal
- Topic: Under Supervised Deep Learning
- Paper: "Self-Supervised Classification Network"
- Grade we are aiming for: Very-good/Excellent
- Title: "A Sensitive Analysis of Self-Supervised Classification Network"
- Brief description of your project plan:
  - Reimplement the proposed method
  - Change the backbone model, classifier architecture, parameters, hyperparameters, and evaluate the results obtained.
  - Additional Methods/Experiments: Sensitivity analysis by changing the above-mentioned points and evaluating the results obtained.
    - Backbone Model: The paper implemented ResNet-50 as the architecture. ResNet-50 is a very deep network, we plan to investigate performances of shallower and/or wider networks.
    - Classifier Architecture: Change the architecture of the MLP used, and the activations of the hidden layers.
    - Parameters: Optimizer: The paper used the LARS and SGD optimizer, we plan to use other optimizers like Adam (or others).  
Learning Rate Rule: We will modify it and compare the results.
  - Dataset: ImageNet
  - Metrics: NMI: Normalized Mutual Information, AMI: Adjusted Normalized Mutual Information, ARI: Adjusted Rand-Index, ACC: Clustering accuracy
- Computational Need and Resources: We are unsure at this point, but we plan to use the GCP credits provided.
- Software Packages: Pytorch mainly, maybe Tensorflow/Keras
- Measuring Success: We will compare the results obtained in our various experiments with the ones mentioned in the paper. If we manage to improve performance, we will consider this a huge success. If we do not, we will still consider it a success since we did a comprehensive sensitivity analysis of the method proposed and contributed to the reproducibility efforts.
- Group Member Aims:
  - Andrea: Further knowledge of Under Supervised techniques, learn a new framework, that of PyTorch, and contribute to the ML community. I'm aiming to participate to the "ML Reproducibility Challenge 2022".
  - Chetan: Knowledge of new field in ML, ability to read research papers, skill of implementing papers on your own.
  - Raghav: Skill of reviewing and deeply analyzing research papers, ability to implement research papers in the ML field, contributing to the ML community through the reproducibility efforts, and knowledge of the topic itself.
- We will reimplement the paper again, and include tests to test the reproducibility as well as going above and beyond it through different experiments.