The background of the slide is a vibrant, abstract image of a cosmic web, showing a complex network of glowing orange and red filaments against a dark purple and blue background, representing the large-scale structure of the universe.

From detection of Galaxy Pairs to Dual Active Galactic Nuclei using Self-Supervised Active Learning Guided Detection System (SSALD)

Collaborators:
Diptarko Choudhury
Aniket Nath

Systematic search for Dual Active Galactic Nuclei is a serendipitous process. We aim to expedite the search process using Machine Learning. We will use the Sloan Digital Sky Survey (SDSS) dataset to implement our algorithm.

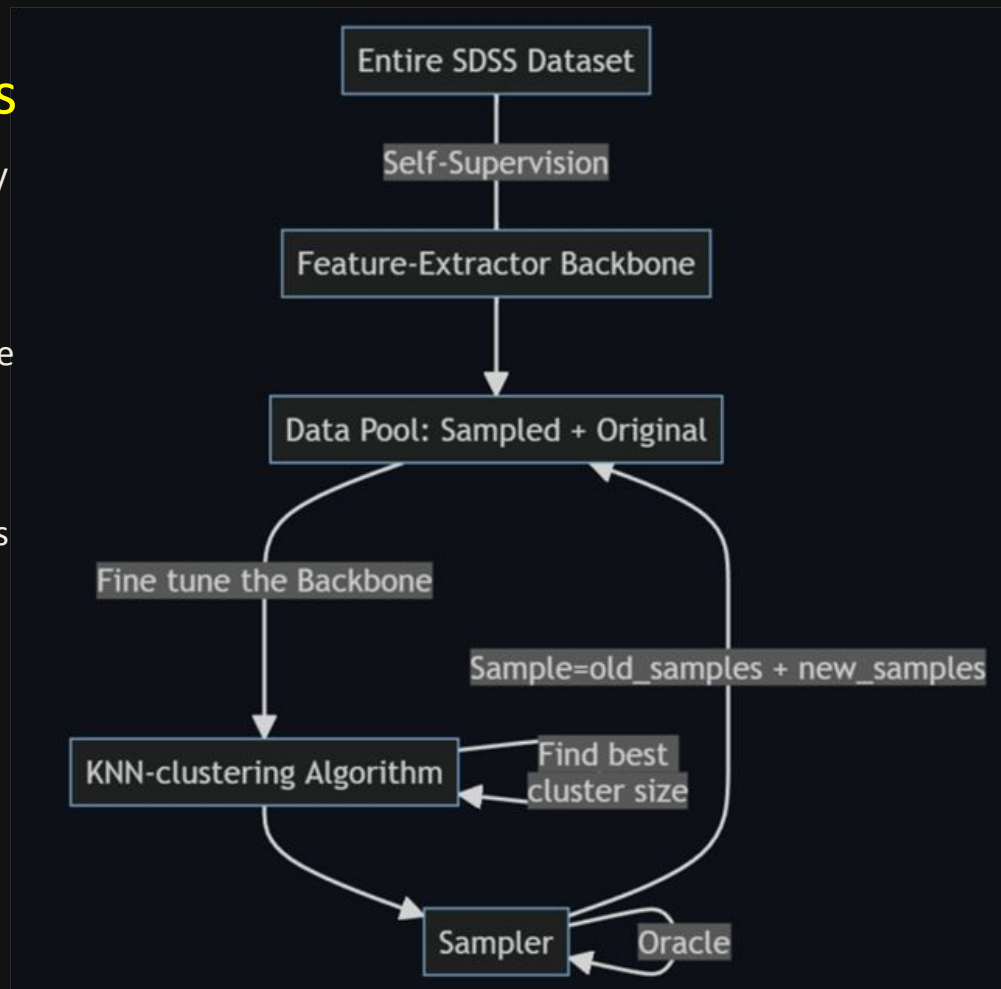
Training Algorithm and Plans

- Base Line: We will start with literature survey and then we will train a self-supervised learning algorithm to understand the morphology of the given dataset without explicit label and then later finetune it for the downstream task of classification.
- Midway targets: To get commendable classification performance from the feature extractor backbone and making sure that it is ready for the next stage.
- Expected results: Once the backbone is ready, we will attach it with a active learning based algorithm to fine grain our classification performance and achieve state-of-the-art results.

Teammate with work division:

Aniket Nath: Explore different self-supervised algorithms, Fine tuning the backbone during active learning phase, labelling the samples during active learning phase.

Diptarko Choudhury: Explore different self-supervised algorithms, Fine tuning the sampler during active learning phase, labelling the samples during active learning phase.



Background Papers:

1. Automated Detection of Double Nuclei Galaxies using GOTHIC and the Discovery of a Large Sample of Dual AGN, Bhattacharya et. al.
 2. Reducing Label Effort: Self-Supervised meets Active Learning, Bengar et. Al.
- More papers to come...