1 Journal Entry for 28 Aug 2023 to 03 Sep 2023

Activities: This week we continued to write our first paper that gave an overview of our field recounting what we are doing, the history of the field, current challenges, and future direction. I have finished writing my sections and we are going to compile it and put the whole thing together so we will definitely be able to turn in the paper in time. Furthermore, we started working on our presentation for the upcoming week, essentially creating a slideshow that covered a lot of the big points that we talk about in our paper as well as our feasibility study. The presentation is essentially finished so we are ready to be able to present it in the upcoming week. What took the most time this week was expanding on the feasibility study code we had worked on the week before. We now have 3 very basic models from data we queried from the SDSS, a SVM Model, a K-Means Model and a Neural Network. All of the models seem to be giving positive results and show signs of things that we want to see, which makes it seem that our reserach problem is feasible to move off from. Though our supervised models are based of of BPT predictions, which is one thing that we want to address in the future, potentially finding another metric to check against to classify for a supervised model.

Challenges: The biggest challenge faced this week was also with code again. It was difficult getting some of the models to work but though it took time we were able to come with some results. At first I had struggled with getting the K-Means model to work, however my group mates were able to help me and we got some visualization that could prove to be handy for investigate purposes and also a way of forming labels for a supervised model. The paper writing was not too difficult, I had pretty much been finished with my part and now we are just trying to link everything together and make it all cohesive.

Plans: For next week, I hope to finalize our paper and presentation. We are almost done with both so we just need to put finishing touches on everything but we should be good to go. The work that we are doing right now is just laying the foundation for everything and as we progress throughout the semester we will now have a basis to actually build a proper model with hopefully better supervised labels that we can use. All in all though preparing for the presentation will be the biggest thing we will have for this upcoming week.

Comments: Overall this week was a solid amount of work with writing the paper and working on the feasibility study. I am looking forward to being able to develop our Machine Learning models and think that we got a really good foundation and idea of the field through writing the initial paper and messing around with data collection and training models. I think that we are in a good place to get a good model and a good research paper out of what we are doing.

2 Journal Entry for 21 Aug 2023 to 27 Aug 2023

Activities: This week I continued writing the first paper to build up a foundation of our research. I found more sources, read them and inserted them into Zotero and was able to develop a more solid understanding of what I was learning. I made a lot of progress this in week of terms of our first paper and I think I have a very solid understanding of the history of our field as that was the task I was assigned to writing for our paper. I think that there is a lot of existing literature on the subject but with the rise of modern computing there is a lot more to do, so I think our topic is a good balance of both and will yield a good research paper. Furthermore, we started developing a simple prototype for our model to gauge its feasibility. We were able to query data from the SDSS and only took a small sample for the initial purpose to see some level of success, and currently we are working on it to get some results. We started out with a K-Means model and we are going to try to develop that but we might switch over to a SVM model as it might more accurately reflect how galaxy emission-line classification works. We will continue working on that up to the next meeting, and continue developing the paper even more but I think we have a pretty good hang of it going into it now.

Challenges: This week the biggest challenges I faced was with my code. I had some trouble getting the K-Means model to work and processing and filtering data. I did get past the initial preprocessing state with data, and am now trying to effectively fit it to a K-Means model and visualize it. However, the K-Means model might identity alternate patterns then what we are trying to discover so it might be more advantageous to switch to a SVM model which is what we should gauge. The paper writing is not posing too much of a challenge, it is just time consuming, but I do find it interesting to go through reserach papers and talk about what I am getting from them.

Plans: For next week, I continue to keep refining our paper and try to get a working model of our prototype. We just want a model that classifies galaxies to some level of success, so that we can keep expanding on that model throughout the semester. It would provide a good basis for working off of and would show us that our project is feasible to some extent. We will also keep writing our paper and attempt to getting a working rough draft by this week so we can assemble a solid final copy by the due date.

Comments: Overall this week was a solid amount of work with writing the paper and developing a simple prototype for our model. I think that it will get a little less stressful as we continue throughout the semester, and establish more of an idea on how we are continuing on our research and what results we are getting out of everything. Also, it may take some more time and effort to get some code working but we should be able to figure it out this week.