

EE/CprE/SE 492 Biweekly Report 6

October 26 - November 20

sddec18-13: Asset management - Financial Factor Discovery - "Value"

Client: Principal Global Investors

Advisor: Chinmay Hegde

Team Members

Carter Scheve — *Communications Lead*

Nathan Hanson — *Project Progress Tracker/Manager*

Caleb Utesch — *Meeting Scribe*

Jack Murphy — *Research Analyst*

Samuel Howard — *Lead Engineer*

Alex Mortimer — *Project Manager*

Biweekly Summary of Progress

This is the sixth bi-weekly report for our senior design class. Since our last report, in which the preliminary modeling was getting implementing, our team has mainly been working on the prediction pipeline application that our client requested. The prediction pipeline is essentially a compilation of the modeling process all integrated into one working python application. We've been using object-oriented analysis and design techniques to create the overall higher-level structure of the application in order to facilitate a smooth transition when we hand our code over to our client, Principal Financial Group. We recently finished our first iteration of development, and have been making minor adjustments and refactorings in order to ensure we produce as good of a product as possible for our client.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Carter Scheve	Models, tree based, pipeline: aggregator(s), tree based, recursive, pca, documentation. For the machine learning aspect, more research into preliminary model results was completed. More research and finalized results from tree based feature selection were completed. These results were shown to the client. The pipeline was also worked on. Tree	23	98

	<p>based feature selection was added to the pipeline, along with helping fix recursive feature elimination. PCA feature selection was also added to the pipeline. From there, aggregation functionality was added through the concrete aggregators and the necessary inheritance hierarchy. All of these classes worked on were documented as well.</p>		
Nathan Hanson	<p>Continued development of prediction pipeline. Began initial documentation, starting with pydoc style documentation for each python module.</p>	12	75
Caleb Utesch	<p>Helped develop the TreeBasedSelector class for the prediction pipeline. Worked on PyDoc documentation for TreeBasedSelector, FeatureSelector, and Aggregator classes.</p>	16	78
Jack Murphy	<p>Worked on implementing the RFE functionality into our Pipeline. Finished proper documentation of code and started working on Final Report and Presentation. Developed RFE design to be modular for an easy transition and handoff of the code over to Principal Financial</p>	14	80
Samuel Howard	<p>Worked on prediction aggregator, feature selection, and prediction path pipeline component. Revised class diagrams to account for new interfaces.</p>	16	82
Alex Mortimer	<p>Finished implementing Random Forest predictive model and obtaining valid results. Spent the rest of the time putting pieces of the Prediction Pipeline together, working out syntax and logic issues, and finalizing the process. Successfully ran the pipeline from start to finish, taking raw stock-level data and turning it into performance predictions and success statistics.</p>	22	91

Pending Issues

- Pipeline needs to be refined and redundant code will need to be removed
 - Formatting the Documentation to be sufficient for our client
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Plans for Upcoming Reporting Period

- Continue refining pipeline combining all parts (data aggregation, feature selection, predictive models, and data reporting)
- Finish up formal documentation
- Provide a historical analysis of model and pipeline performance with different settings
- Start working on final documentation required by the class