# Sample UCL-styled A0 scientific poster LATEX

Shaun Dowling, Alessandro Ialongo, Andrey Levushkin, Matthieu Louis University College London



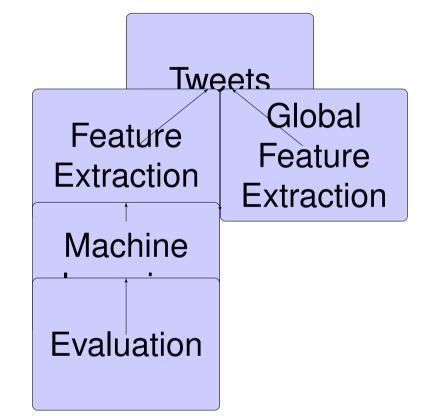
Sectioning

# Introductory segment

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Vestibulum justo. Praesent leo. Sed consectetuer. Aenean pretium, diam quis mattis porttitor, elit velit scelerisque sapien, sed convallis ipsum lectus non neque. Morbi in mi eu neque luctus scelerisque. Curabitur odio. Mauris a mi. Aenean iaculis erat vel sapien. Curabitur nulla velit, feugiat quis, imperdiet sit amet, vestibulum ac, diam. Suspendisse a metus. Pellentesque vulputate venenatis eros. In auctor, eros nec sodales faucibus, erat nisl facilisis nisl, ut rutrum nisl nunc eu est. Quisque eget ante at nunc varius ultrices.

### First Piece of Content

It is worth fiddling around a bit with positioning of the text blocks to get the spacing even. I like a vertical gap of about 0.4 "block units" between the horizontal bar at the end of one block and the beginning of the next. There are contruction lines at the end of the T<sub>F</sub>X file to help with this.



Figures (and labels using the LATEX picture environment) work as you would expect.

#### Feature Extraction

The key objective of this project is to use information contained within Twitter posts to predict the mood of the markets towards certain stocks. Tweets contain a great deal of information, including the text itself, linking between users, linking to entities (either explicitly view a tag or plain text) and network effect via re-tweets.

In their raw form, Tweets are not convenient for inference. As such we will focus a great deal of our time distilling the information contained within the Tweets into a form that we can use easily, ensuring all important aspects of the Tweets are preserved. This approach gives a nice layer of abstraction between the Information Retrieval and the Machine Learning steps in the pipeline. We will be gathering these features using two independent MapReduce jobs.

#### Global Statistics

Firstly, we will run a global job to gather statistics that depend on the entire dataset (for example tf/idf). The statistics available and the mannerr in which they are gathered will be a significant area of experimentation.

Some statistics that we plan to start with are:

- user average sentiment to help us determine if someone's good opinion of an entity is only because they are generally positive. This could be global or regarding a specific company.
- inverse document frequency to be used with term frequency within tweets to potentially highlight particularly significant phrases

# Machine Learning

The feature extraction process provides the raw material on which to construct models to explain the data and to formulate predictions about stock prices given new Tweets. In our project we will consider three main statistical models to uncover the patterns in the data:

- Linear Regression
- Support Vector Machine (SVM)
- Gaussian Process

Each of these models will make use of a portion of the available Twitter data (between 70% and 90% of the data, ordered chronologically) in combination with stock price data to extract the optimal parameters (according to a loss function). The parameterised models will then be used to predict the more recent performance of the relevant stocks given the remaining portion of the Twitter data. These predictions will then be evaluated against the real-world performance.

Linear Regression We will use regularised linear regression with the MSE (mean

squared error) loss function (ridge regression) to give us a simple baseline on our predictive performance. With this simple model, we hope to find a linear relation (i.e. linear coefficients) between the features previously extracted and the stock prices. The (Tikhonov) regularisation will be parameterised by a lambda value which will determine the extent to which more complex (larger) coefficients will be penalised in our MSE loss function.

SVM When predicting simple increase or decreases in stock prices (see evaluation),

the problem becomes a classification rather than a regression one. Thus we can use a support vector machine (experimenting with possible kernels and respective parameters) to fit a hyperplane in the feature space between the time splits in the Twitter data that corresponded to increases in the relevant stock prices from those that corresponded to decreases.

Gaussian Process For the regression task we will also attempt to describe the stock

market as a Gaussian interaction of multiple samples defined by a suitable (kernel) covariance matrix. Defining this matrix will allows us to model periodicities, and the decay of correlation between adjacent samples. Out of the three, this model is the most elaborate as it allows for the greatest flexibility on the relation between the features and the stock prices. In fact the kernel covariance can encode very complex nonlinear relations between features and data-points. This requires also a higher degree of cross-validation to select the most effective kernel and its hyperparameters.

## First Subsection

Aenean feugiat, mauris vitae accumsan venenatis, tortor nunc facilisis velit, vel aliquam felis dui non ante. Aenean commodo, sem vel malesuada placerat, erat lacus lacinia magna, quis euismod quam nulla vitae turpis. Vivamus sapien. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Nunc a dolor. Sed diam leo, fringilla non, fermentum non, ultricies tempor, dolor. Mauris vehicula, urna ac bibendum scelerisque, enim nisl vehicula libero, id blandit enim lacus et neque. Nunc posuere elit at erat. Integer commodo, eros dapibus blandit facilisis, dolor ipsum dictum dui, sit amet iaculis enim elit sed magna. Nunc libero nunc, malesuada sit amet, tincidunt at, pharetra ut, arcu.

#### Second Subsection

Integer ante. Mauris tincidunt adipiscing mi. Donec sollicitudin, lacus quis pellentesque placerat, quam elit pharetra lacus, sit amet placerat nisi quam in lorem. Etiam id nulla a est vestibulum tempus. Nam et nisl non arcu venenatis semper. Duis sed libero. Cras lectus. In semper urna in leo. Sed mattis lacinia arcu. Phasellus ut metus. Phasellus mi dolor, condimentum ut, ornare nec, tempus ac, mi. Integer ante sem, vestibulum in, gravida vel, condimentum non, ipsum.

## Discussion and Conclusions

Etiam sit amet nisi. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Phasellus pharetra lacus. Aliquam erat volutpat. Donec leo. Mauris dapibus, magna sed hendrerit volutpat, massa magna euismod metus, vel gravida purus odio eget neque. Proin nibh turpis, commodo at, viverra sed, auctor vel, turpis. Mauris massa lacus, malesuada at, consectetuer at, condimentum non, nibh. Sed laoreet, lorem non tristique sodales, mauris nisi molestie dolor, ac volutpat nisl augue id nibh. Mauris orci. Donec non lacus. Duis ut arcu. Aliquam sed lacus eget dui sollicitudin pellentesque. Nunc lacus nisi, semper nec, pellentesque non, dapibus sollicitudin, metus. Aenean ac enim et est sollicitudin ultricies. Integer vitae magna vitae velit condimentum dapibus. Aenean nec sem ut massa condimentum faucibus.

Proin dignissim nunc in nulla. Vivamus non leo. Nulla ultrices tempor dui. Curabitur nec metus. Aliquam sed libero. Cras orci odio, molestie a, suscipit in, placerat vel, nunc. Vestibulum congue, nunc in faucibus scelerisque, ante tortor dapibus nibh, eu tristique diam urna ac magna. Proin cursus. Morbi quam ligula, fermentum vel, dapibus sit amet, euismod nec, justo. Suspendisse potenti. Nulla eu elit. Pellentesque quam est, pretium ac, suscipit sed, viverra id, sapien. Donec tempor semper tortor. Nunc vulputate. Aliquam vitae metus ut sem euismod accumsan. Duis tincidunt lacus sed ipsum. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Quisque nec nisl at erat ornare tempus. Etiam eros odio, ultricies non, hendrerit et, vestibulum in, felis. Vivamus gravida.

- First concluding point; we expected this to be so because of the contruction of the argument and blah.
- Second concluding point: this one is counterintuitive but we can justify it by reference to the extended discussion above.
- Third and most important concluding point: this is the one we're excited about.

ויטי