

# TFBAG

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## Project Description

The project consists in developing a web interface to display historical financial market data through an intuitive graphical representation.

The central part of the application is a time-based “top of book” view, representing the best ask and bid on the market over time. This view is zoomable to very fine grained levels (individual intraday trades and orders, up to millisecond accuracy) and also pannable across time ranges. This view can then be complemented by overlaying custom time series data, highlighting specific orders, and the ability to identify and jump to specific events. These time series, orders and events constitute supplementary datasets for the purpose of cross-referencing these datasets to the market data.

Furthermore, the full order book contents at a given time can be displayed, with individual orders represented on each level. The list of add/modify/delete order events that constitute changes to the order book over time is also displayed.

The scope of the project is not to distribute market data but rather to offer a visualization layer on existing market data for companies like Squarepoint which already own large datasets internally.

## Risk

- The required market data is not easily accessible for free.
  - The [Wharton Research Data Services](#) offers [Trade and Quote](#) data for research purposes and lists the John Molson School of Business as an affiliated association. We are currently looking into having access to this data source.
  - The company also owns the data required but cannot easily distribute it for our development purposes.

- If we cannot access the data from WRDS or from the company, then it is still possible to develop the application around generated mock data.
- The size of the dataset poses a technological risk as the application must have sufficient throughput to allow visualization of the data in a timely manner.
  - This will be tackled by prototyping on a smaller subset of the data initially and then expanding into finer levels of granularity.

## Competition (max 1 page, min 3 competitors)

**Search terms:** market data, market data order book, market data visualization, market data screeners, exchange book viewer, trades viewer, order book finance visualization

### Pages examined:

<a href="https://lobsterdata.com/">https://lobsterdata.com/</a>	<a href="https://money.cnn.com/data/markets/">https://money.cnn.com/data/markets/</a>
<a href="https://www.marketwatch.com/tools/stockresearch/screener/">https://www.marketwatch.com/tools/stockresearch/screener/</a>	<a href="https://www.imperialinvestor.cibc.com/iis/market-watch/overview.html">https://www.imperialinvestor.cibc.com/iis/market-watch/overview.html</a>
<a href="https://www.quotemedia.com/contentolutions/stock_screeners">https://www.quotemedia.com/contentolutions/stock_screeners</a>	<a href="https://www.bmoinvestorline.com/selfDirected/marketInfo.html">https://www.bmoinvestorline.com/selfDirected/marketInfo.html</a>
<a href="https://finviz.com/">https://finviz.com/</a>	<a href="https://vertex-analytics.com/">https://vertex-analytics.com/</a>
<a href="https://www.questrade.com/self-directed-investing/tools/market-intelligence">https://www.questrade.com/self-directed-investing/tools/market-intelligence</a>	<a href="http://parasec.net/transmission/order-book-visualization/">http://parasec.net/transmission/order-book-visualization/</a>
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<a href="https://finance.yahoo.com/screener/">https://finance.yahoo.com/screener/</a>	<a href="https://bookmap.com/#intro">https://bookmap.com/#intro</a>
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<a href="https://www.tradingview.com/">https://www.tradingview.com/</a>	<a href="https://www.bitfinex.com/order_book">https://www.bitfinex.com/order_book</a>
<a href="https://www.marketwatch.com/tools/screener">https://www.marketwatch.com/tools/screener</a>	<a href="https://www.interactivebrokers.com/en/index.php?f=771">https://www.interactivebrokers.com/en/index.php?f=771</a>
<a href="https://www.barchart.com/ca/stocks/stocks-screener?popularScreener=33154&amp;viewName=filter_view">https://www.barchart.com/ca/stocks/stocks-screener?popularScreener=33154&amp;viewName=filter_view</a>	<a href="http://people.stern.nyu.edu/jhasbrou/TeachingMaterials/BView/SingleBook%20and%20BView.pdf">http://people.stern.nyu.edu/jhasbrou/TeachingMaterials/BView/SingleBook%20and%20BView.pdf</a>
<a href="https://www.wsj.com/market-data">https://www.wsj.com/market-data</a>	

### Yahoo Finance Screener

Offers many metrics on a wide variety of instruments, with fairly low latency. Events must be added manually to the graphs, while our application can import events and indicators directly from an existing time series dataset. Only aggregate data is available, with the highest granularity of 1 minute intervals while our application permits detail on a trade by trade basis.

### **Cboe Book Viewer**

Displays the top 5 bid and ask levels, updated in real time.

Does not allow the user to view historical data, or more than 5 levels while our application allows to display full book contents over any period of time.

### **Nasdaq Book Viewer**

Displays full book contents at the current time, along with individual orders and the time at which they were created.

Requires a monthly subscription and cannot display past data.

## **Description of Customer and Company**

Squarepoint is a systematic quantitative investment manager trading in markets globally. They develop and maintain their own automated trading platform, perform quantitative investment research and deploy investment strategies to hedge market conditions.

Our customer, [Pierre-Marc Fournier](#), leads the Market Data team at Squarepoint and has occupied this position for more than four years. He is experienced with managing software projects as well as the challenges that come with large amounts of data relating to various financial instruments.

Such a tool would benefit Squarepoint in daily tasks such as debugging, research and compliance by providing a visual medium that does not require a technical background to use. Furthermore, this tool could also be useful for education by providing a graphical representation of the interaction between the company's trade flow and the market.