Dynamic Locus Display

Saving users clicks one page at a time

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Problem Description

- Currently, locus is a wholly static interface. It calls for undue effort on the users' end.
- Users often lose time navigating long paths before landing at their site of interest.

Market Views > Listed Derivatives > Volatilities > Long End Volatilties > Constant Maturity

Assumptions

- End of path vs. single page.
- Unvisited pages (in entire dataset)

Our Solution

A Two-Pronged Approach!

- Learn how sites are viewed in a broad context.
- Learn how sites are viewed over time.

Tech Stack

- Back-end
  - pandas, scikit-learn, numpy
  - TensorFlow , Keras
- Serving
  - Flask
- Front-end
  - Plain HTML + CSS

Multiclass Classification: **The Test Results**

With KNN:

~30% accuracy in top site suggestion.
~70% success in set of 7 site suggestions.

Compare with <0.03% baseline for >3,000 distinct classes

(Difficult multiclass problem)

Multiclass Classification: **Behind the Scenes**

- 7 Features Selected from Data
  - Personal, contextual, business events
- Handling new users

Time Series Prediction: (Deep Learning)

```
2018-05-25 10:17:17.807877: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1053] Created TensorFlow device
b:localhost/replica:0/task:0/device:GPU:0 with 15052 MB memory) -> physical GPU (device: 0, name: Tesla P100-PC
6GB, pci bus id: 0000:00:04.0, compute capability: 6.0)
22498/22498 [==============================] - 96s 4ms/step - loss: 10728.7678 - val_loss: 74007.7619
Epoch 2/100
22498/22498 [==============================] - 94s 4ms/step - loss: 7844.5424 - val_loss: 65616.0839
Epoch 3/100
22498/22498 [==============================] - 98s 4ms/step - loss: 7400.6440 - val_loss: 62745.6039
Epoch 4/100
22498/22498 [==============================] - 95s 4ms/step - loss: 7344.4568 - val_loss: 61743.5540
Epoch 5/100
22498/22498 [==============================] - 95s 4ms/step - loss: 7337.9575 - val_loss: 61410.3878
Epoch 6/100
22498/22498 [==============================] - 95s 4ms/step - loss: 7541.3656 - val_loss: 67433.7585
Epoch 7/100
22498/22498 [==============================] - 95s 4ms/step - loss: 7175.7199 - val_loss: 61665.6290
Epoch 8/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6712.2481 - val_loss: 58079.7443
Epoch 9/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6494.3732 - val_loss: 55762.6770
Epoch 10/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6411.5367 - val_loss: 54273.9631
Epoch 11/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6382.2171 - val_loss: 53567.7659
Epoch 12/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6395.7412 - val_loss: 52921.0103
Epoch 13/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6471.4814 - val_loss: 52225.8213
Epoch 14/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6349.8585 - val_loss: 52696.7913
Epoch 15/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6326.5770 - val_loss: 52102.3306
Epoch 16/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6733.4638 - val_loss: 51432.5159
Epoch 17/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6344.1902 - val_loss: 52013.3638
Epoch 18/100
22498/22498 [==============================] - 95s 4ms/step - loss: 6325.4973 - val_loss: 52241.3693
Epoch 19/100
```

Time Series Prediction

- Dynamic path suggestion
- LSTM (Long Short Term Memory)
- Learn trends in page visits over time

Demo!

Next Steps

- Better exploration algorithm (SVD, Graph Algorithms)
- Additional features, more data
- Performance metric analysis