Graph Algorithm – Efficient Shortest Path Estimation

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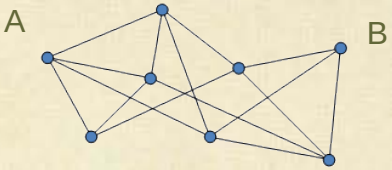
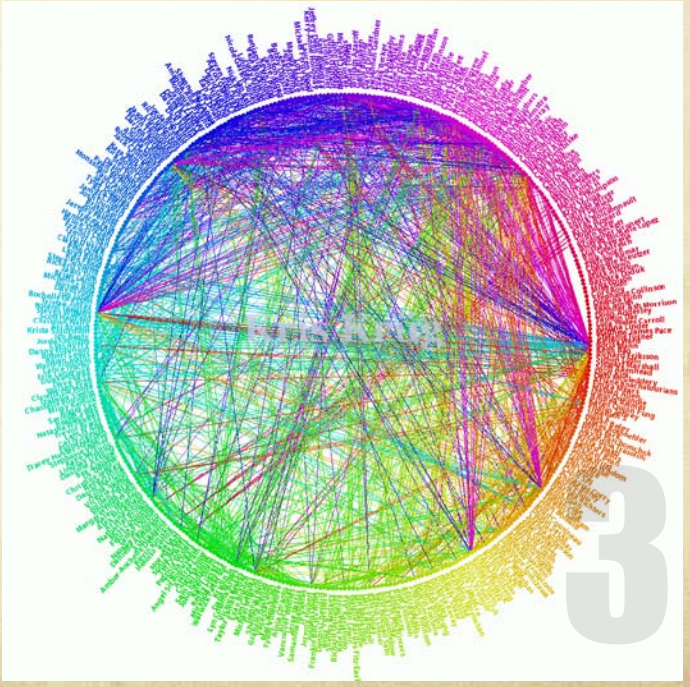
Shortest Path Algorithm

- We are trying to develop a general algorithm for graph navigation
- It will work with any dataset, i.e. Google, Facebook, Last.fm
- It is optimized for massive databases
- It is extremely efficient regardless of the size of the graph.

Simple case:



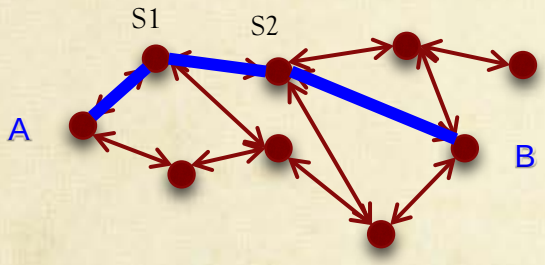
Reality:

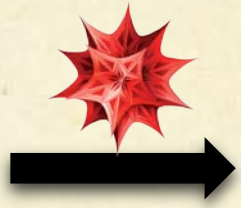


Source: my facebook, www.facebook.com/yonkshi

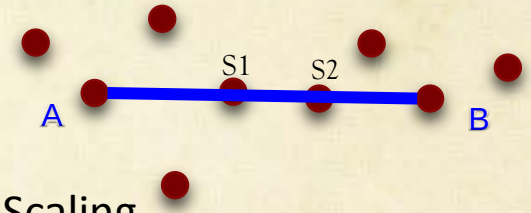
Algorithm

Dimensionless Data





2 Dimensional Data

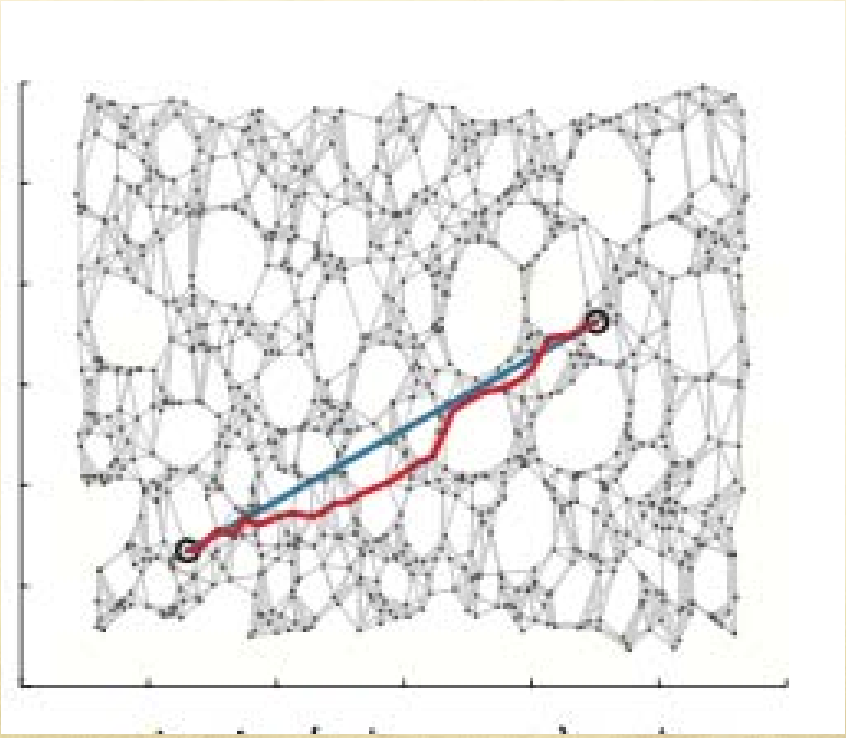


MDS: Multidimensional Scaling

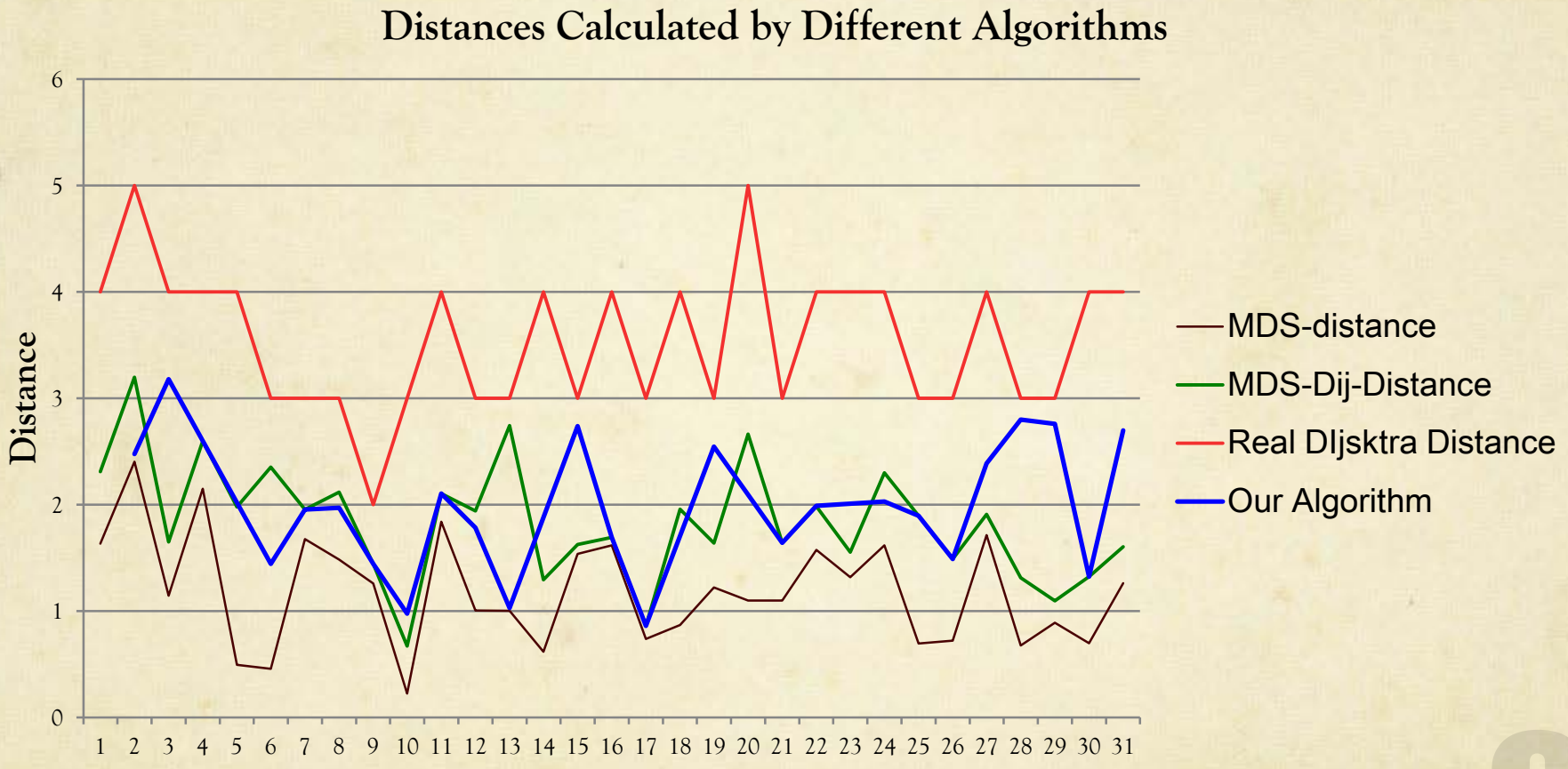
- Preserved Distances
- Preserved Paths

Algorithm

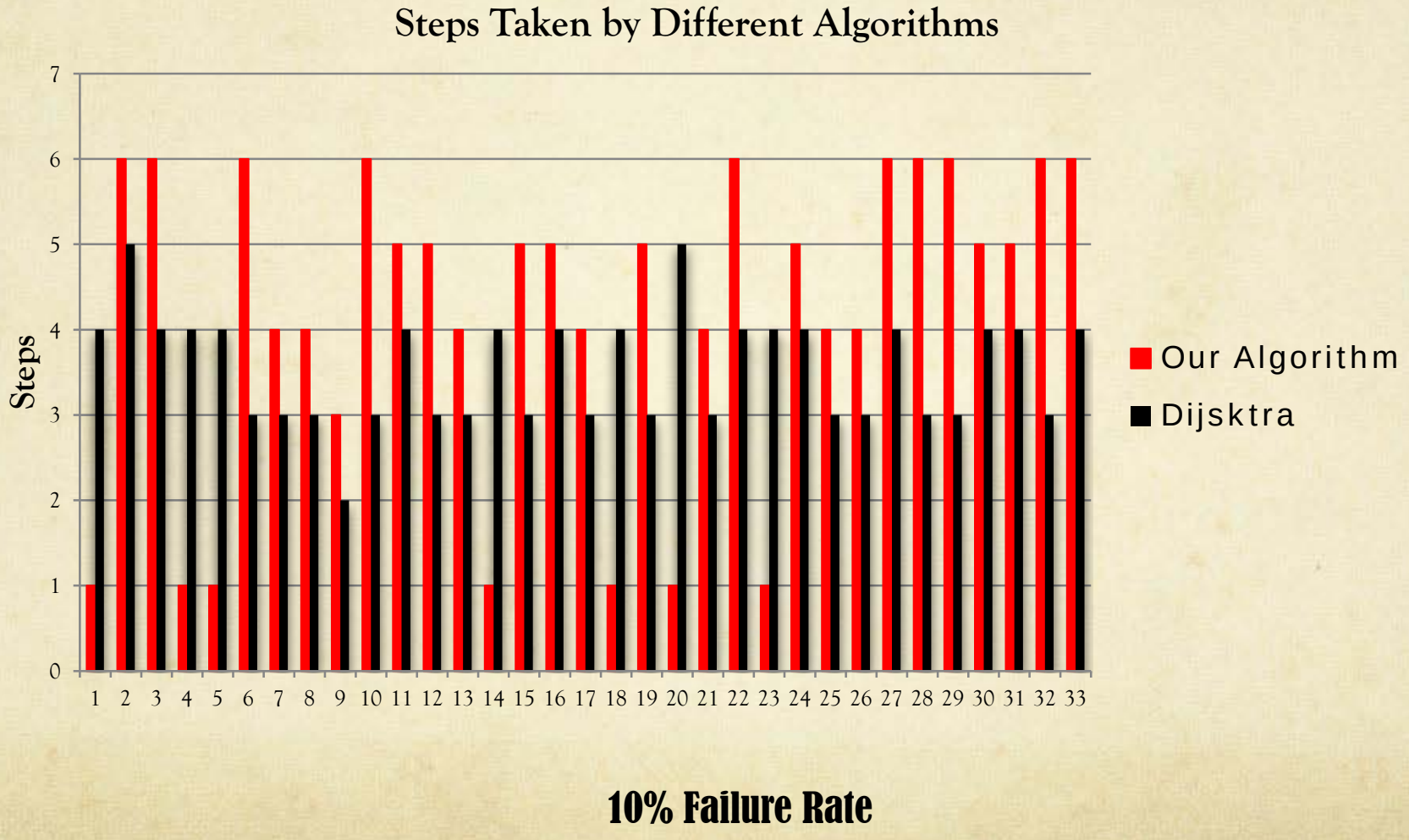
In reality, MDS generates an approximation of coordinates, thus the distance is approximated



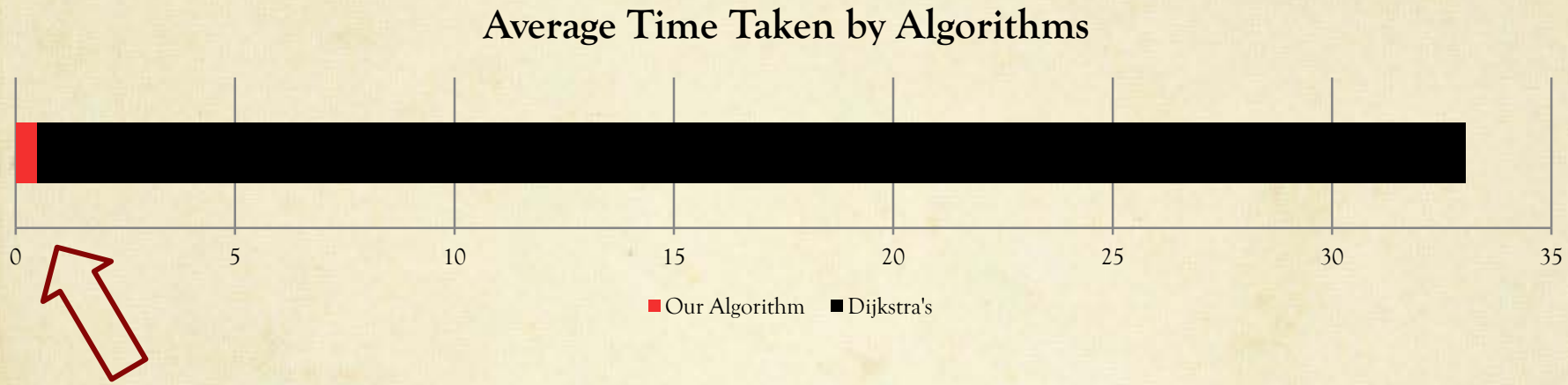
Experimental Results



Experimental Results



Experimental Results



As much as 3000x
Faster than Dijkstra's Algorithm

Conclusion

- We have designed a shortest path algorithm
- It is very efficient and accurate for large databases
- It is much faster than Dijkstra's Algorithm

Our future goals:

- Reduce failure rate to 0% (while maintaining accuracy)
- Increase high efficiency and accuracy
- Add "Label" information for even more accurate search

Thank You!

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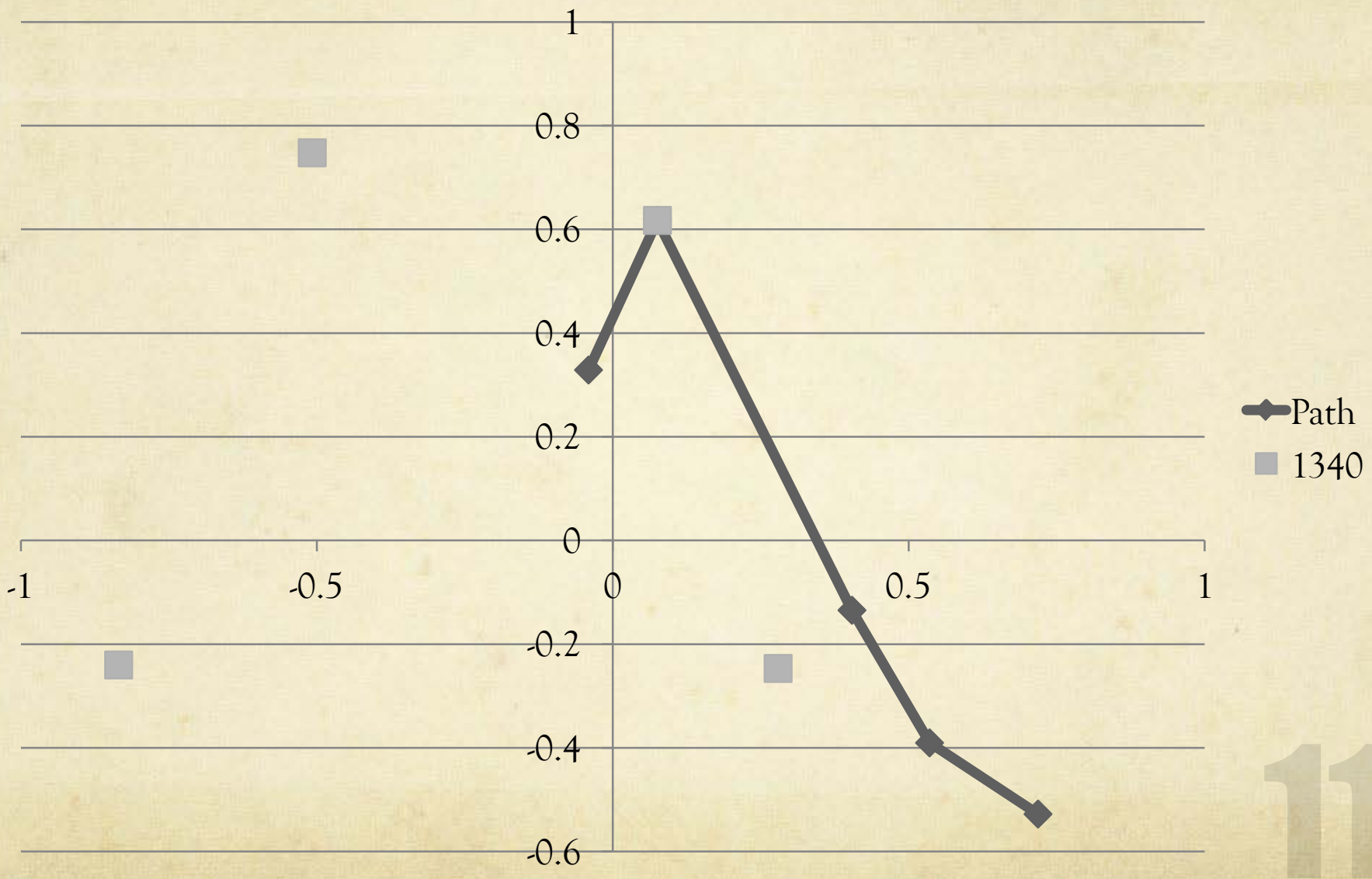
Professor Martin Chetlen from Moorpark College
Awesome Roommates Adam, Michael and Jose


1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-1
-0.5
0
0.5
1
Path
1340