An Artificial Intelligence-based Industry Peer Grouping System

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Abstract

In this work, we develop a data-driven peer grouping system using artificial intelligence (AI) tools to capture market perception and, in turn, group companies into clusters at various levels of granularity. In addition, we develop a continuous measure of similarity between companies; use this measure to group companies into clusters and construct hedged portfolios. In the peer groupings, companies grouped in the same clusters had strong homogeneous risk and return profiles, while different clusters of companies had diverse, varying risk exposures. We extensively evaluated the clusters and found that companies grouped together by their method had higher out-of-sample return correlation but lower stability and interpretability than companies grouped by a standard industry classification system. We also develop an interactive visualization system for identifying AI-based clusters and similar companies.

Introduction

Peer Grouping System: Similar companies grouped together

- Automobiles: Ford Motors, General Motors, Jeep etc
- Finance: JP Morgan, Bank of America etc.

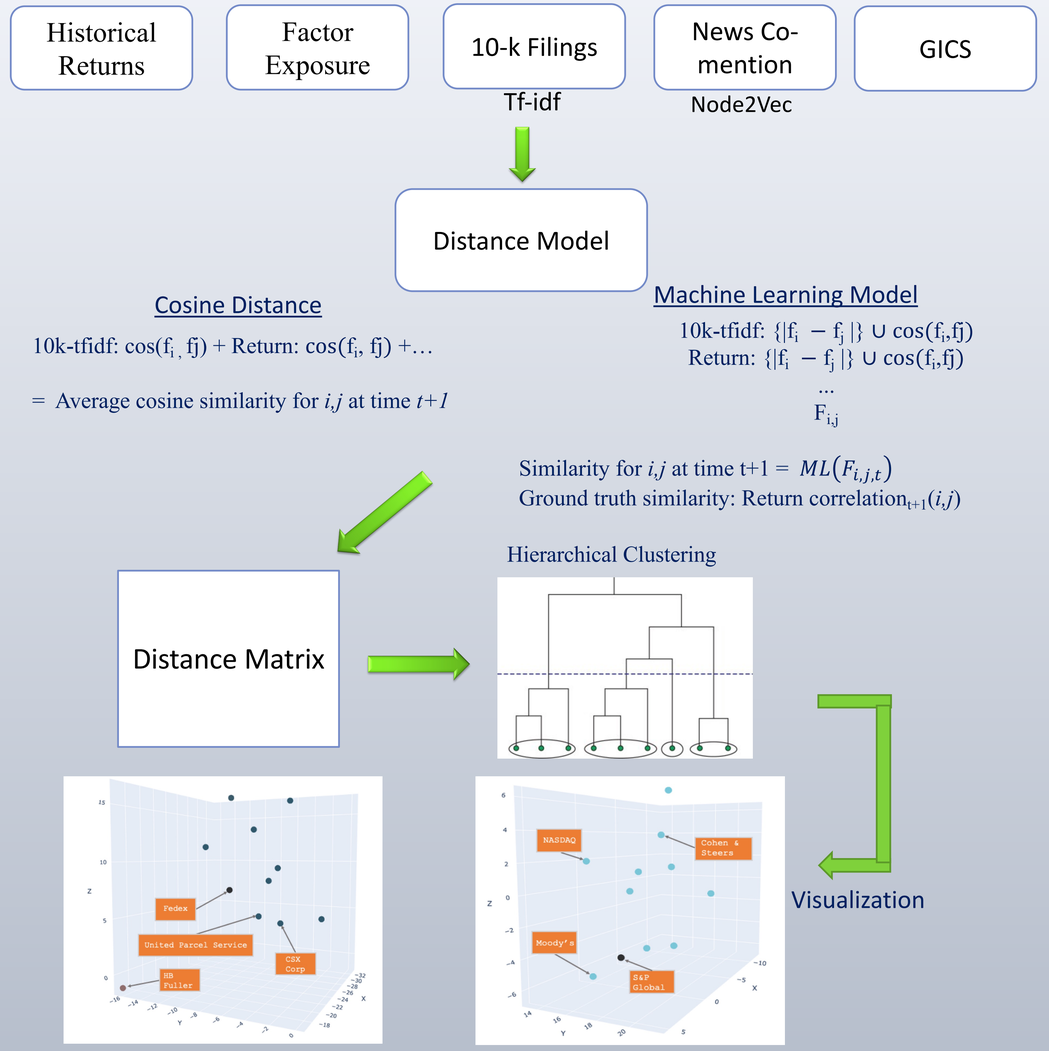
Groups on the basis of revenue and earnings

- ICB : Industry Classification Benchmark
- GICS: Global Industrial Classification System

Applications:

- Similar companies for hedging portfolios
- Estimating characteristics of new companies
- Obtaining competitors.
- Risk management.

Method



Characteristics:

- Dynamic peer grouping system
- Developed a measure of the similarity score
- Incorporate information from multiple sources
- Incorporated market perception focus on investment management

Case Studies:

1) FAANG: Prominent American technology companies and popularly referred to as “FAANG” were grouped together and they belong to different groups in GICS.
2) 2014 : eBay grouped with fintech companies. 2015 : eBay sold Paypal. 2018 : eBay grouped with e-commerce sites
3) Walt Disney: GICS grouped with movies and entertainment. AIPGS grouped with cable and broadcasting companies. Launched their streaming service Disney+ in 2019.

Feature Importance:

Historical return correlation > GICS > Business description > Factors (size, momentum, debt-asset)

Conclusions

Developed a dynamic peer grouping system that performed better than baselines grouping method.

AIPGS incorporates market perception and information from multiple data sources.

Limitation: **Cannot** assign human **interpretable** meaning to all clusters.

Peer groups obtained from different models can be used by individuals depending on requirements