

The main objective of this thesis is to summarize and mainly interconnect the existing methodology on correlation matrix filtering, graph algorithms utilized in the minimum spanning trees, hierarchical clustering and principal components analysis in order to create quantitative investment strategies. Instead of traditional usage of stocks returns series, factor models residuals are utilized. Residuals are then an ultimate input for all the algorithms to arrive at probability of centrality (PoC) -- an impure probability where values near 1 signalize high probability of a stock being central in the network. Several investment strategies are created based on PoC and tested on data from major US stock market indices. It cannot be imperatively argued that peripheral-based strategies are always better than central-based strategies. Both central and peripheral-based strategies share high upside profit potential at the cost of high volatility whereas traditional Markowitz's optimization process yields stable profits with moderate upside potential.