1. Statistical Models

* Test autocorrelation of features (should vanish)
* Test cross-correlation (generally low and indicates diverse parameters)
* KNN models with Euclidean Distance (Kaya *et al.*, 2010)
* Improve Euclidean distance by using Mahalanobis distance, which scales differences by the variables’ covariance matrix and accounts for correlations among factors (Kaya *et al.*, 2010)
* Correlation distance
  + It computes the shape similarity. It is suitable for two periods with different magnitudes in their observed data, but have similar patterns
* Cosine SImilarity
  + Compute the geometric angle between the vectors, which is independent of the magnitude

1. Clustering Models

* K-means clustering (Crone, 2005)
* Gaussian Mixture Model (GMM) (Bott & Bao, 2021)
  + Use various Gaussian distributions to model different parts of the data
  + Data-driven unsupervised model

1. Econometric Models

* Hidden Markov Models (Wang, et al. 2020)
  + Use HMM models to identify different market regimes in the US stock market
  + Assume that latent states, such as market regimes, follow a Markov chain, and that the observation data are generated conditionally on these states.
* Regime-Switching Models (Zhu, 2022)
  + Capture cyclical/latent state-driven patterns
  + Identify which state the current stage would potentially switch to

1. Machine Learning & Deep Learning

* If with labelled data, can use Support Vector Machines / Decision Trees
* Use transformers / self-attention for capturing relations between regimes

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Kaya, Hakan, et al. “Regimes: *Nonparametric Identification and Forecasting*.” *The Journal of Portfolio Management*, vol. 36, no. 2, Jan. 2010, pp. 94–105. *DOI.org (Crossref)*, https://doi.org/10.3905/JPM.2010.36.2.094.

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Wang, Matthew, et al. “Regime-Switching Factor Investing with Hidden Markov Models.” *Journal of Risk and Financial Management*, vol. 13, no. 12, Dec. 2020, p. 311. *DOI.org (Crossref)*, https://doi.org/10.3390/jrfm13120311.