NANYANG TECHNOLOGICAL UNIVERSITY
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Applications of Machine Learning In Portfolio Management

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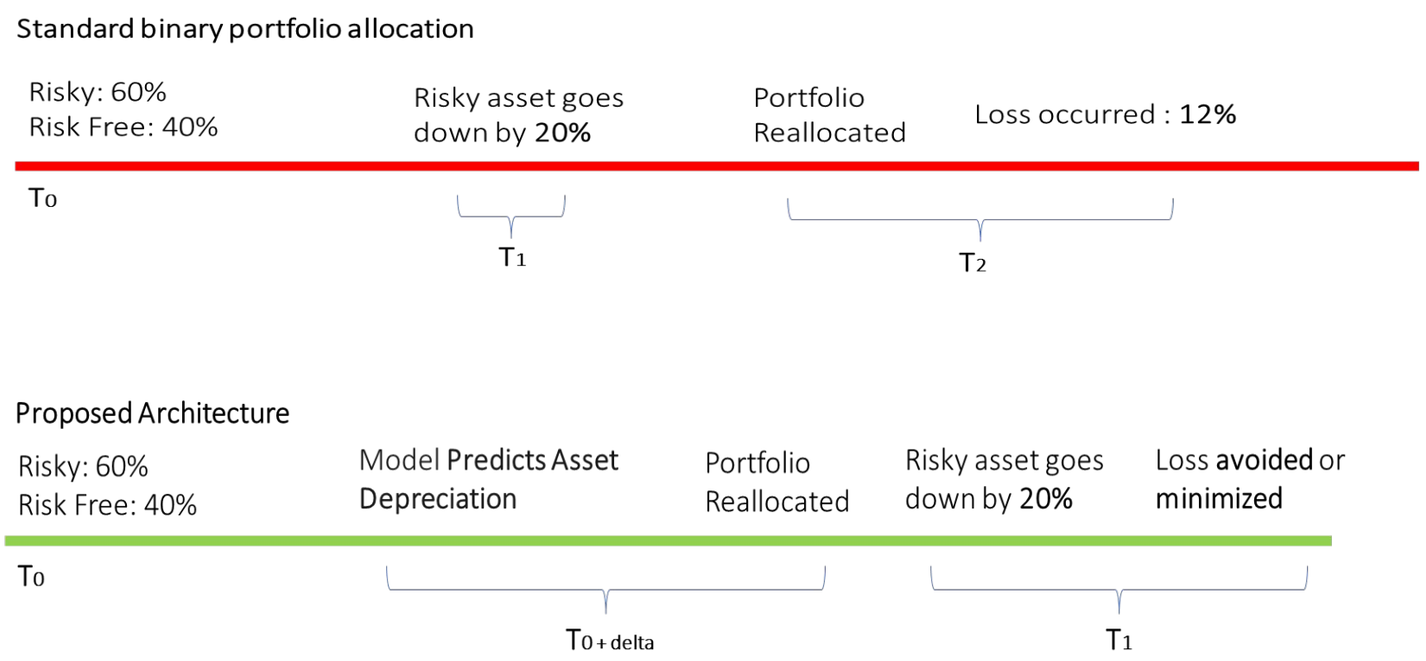
Project Objectives:

Advances in predicting market returns using machine learning have seen tremendous growth which can be attributed to veritable data mining and computational capabilities. However, a large portion of this literature focuses on short-term effects by evaluating models solely on their prediction error rates. Long-term consequences of these predictions across a portfolio are not assessed and as such the compounding effects remain unexplored. This project proposes a novel framework towards implementing the Constant Proportion Portfolio Insurance (CPPI) strategy aided by predictive returns.



The proposed architecture consists of a preprocessing pipeline for extracting and enhancing data from 49 ETFs. These datasets are used to train SVR, LSTM and FBProphet models and the corresponding predictive returns are used to train an optimized CPPI model. Our results report that all models achieve better performance than standard CPPI and amongst these models, LSTM architecture has the best performance attributed to a 13.76% increase in Portfolio Sharpe Ratio.