Algorithmic Trading System Project Plans

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Overview of Project

This project is to design an algorithmic trading system in a dynamically evolving way of tracking the asset class and market. Besides the traditional pre-trading design and prediction based on Real-time/Historic data, the Post-Trade analysis will include Data Optimisation and Model Optimization components which are the distinguishing features from the traditional trading system. The system will do the Post-Trade Analysis based on the machine learning algorithms implemented. We will design the algorithmic trading system; select and analysis algorithms to implement; choose historical data to simulate a algorithm trading process and write a report based on the performance and practicability.

Work Package Description

Use a table to describe each work package and subsidiary tasks, people responsible, duration and deliverables. A possible structure is given below:

WP1: Pre-trading Design					
Participant	J.G., S.W, T.Z., X. Z	**Duration**	19/5/2022 – 08-06-2022	**Deliverable**	
The Pre-Trading Design is the first part of the system we need to finish. Including the Asset Optimization, Trading Environment. *Determine the asset will be used in our trading system and download data.* At the same time, we need to write the Literature Review for our project					
T1.1 Literature Review					
Participant		**Duration**		**Deliverable**	
Reading papers and Writing Literature Review.					
T1.2 Trading Environment					
Participant		**Duration**		**Deliverable**	
Infra-structure; Regulation constraints; Compliance considerations					
T1.3 Data access					
Participant		**Duration**		**Deliverable**	
Determine and Download data.					

WP2: Real-time/Historic Data					
Participant		**Duration**	09/06/2022 – 15/06/2022	**Deliverable**	
In this part, We will be doing the price prediction based on the acquired price data and considered environment impacts or social concerns, etc.					
T2.1 Data Cleansing					
Participant		**Duration**		**Deliverable**	
Cleaning data that will drive our algorithmic trading.					
T2.1 Price prediction					
Participant		**Duration**		**Deliverable**	
Considering the important informations we need for the data in order to have a better price prediction.					

WP3: Data Optimization					
Participant	S.W, X. Z	**Duration**	16/06/2022 –10/08/2022	**Deliverable**	
The Data Optimisation is the firt part of the Post-Trade Analysis. Features and algorithms will be selected and implemented for the algorithmic trading system.					
T3.1 Feature selection					
Participant		**Duration**		**Deliverable**	
Choose and use features like Covariance Threshold, Shrinkage methods, etc. Gives detailed mathematical explanation of each method used and their implementation.					
T3.2 Feature mapping					
Participant		**Duration**		**Deliverable**	
Using methods like Nystrom, Isomap to optimize our data for better fitting and performance in the model optimization part.					
T3.3					
Participant		**Duration**		**Deliverable**	

WP4: Model Optimization					
Participant	J.G., T.Z.	**Duration**	16/6/2022 – 10/08/2022	**Deliverable**	
In this part, We will be selecting and training models based on optimazed data.					
T4.1 Model selection					
Participant		**Duration**		**Deliverable**	
Reading papers and Writing Literature Review.					

T4.2 Model training					
Participant		**Duration**		**Deliverable**	
Infra-structure; Regulation constraints; Compliance considerations					
T4.3 Hyper-parameter tuning					
Participant		**Duration**		**Deliverable**	
Determine and Download data.					

WP5: Trading Execution					
Participant	J.G., T.Z., S.W, X. Z	**Duration**	11/8/2022 – 31/8/2022	**Deliverable**	
Executing orders for the selected asset					
T5.1 Portfolio Optimization					
Participant		**Duration**		**Deliverable**	
Using machine Learning algorithms to find the best portfolio					
T5.2 Trading Model					
Participant		**Duration**		**Deliverable**	
Infra-structure; Regulation constraints; Compliance considerations					
T5.3 Accumulation					
Participant		**Duration**		**Deliverable**	
Wrapping up the trading system. Finishing the dissertation.					

Gantt Chart

Also useful is a timetable – such as a Gantt chart – showing the estimated duration of each work package and task. Depending on the duration of the project,

		Weeks/Months 1-12													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
WP1: Pre-trading Design																
T1.1	Literature Riview															
T1.2	Trading Environment															
T1.3	Data access															
WP2: Real time/Historical Data																
T2.1	Data Cleansing															
T2.2	Price predication															
WP3: Data Optimization																
T3.1	Feature selection															
T3.2	Feature Mapping															
WP4: Model Optimization																
T4.1	Model selection															
T4.2	Model training															
T4.2	Hyper-parameter tuning															
WP5: Trading Execution																
T5.1	Portfolio Optimization															
T5.2	Trading Model															
T5.3	Accumulation															