Optimizing Trading Strategies with Reinforcement Learning

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Agenda

- Background
- Domain and Architecture Models
- Demo and code
- Deliverables
- Conclusion

Agenda

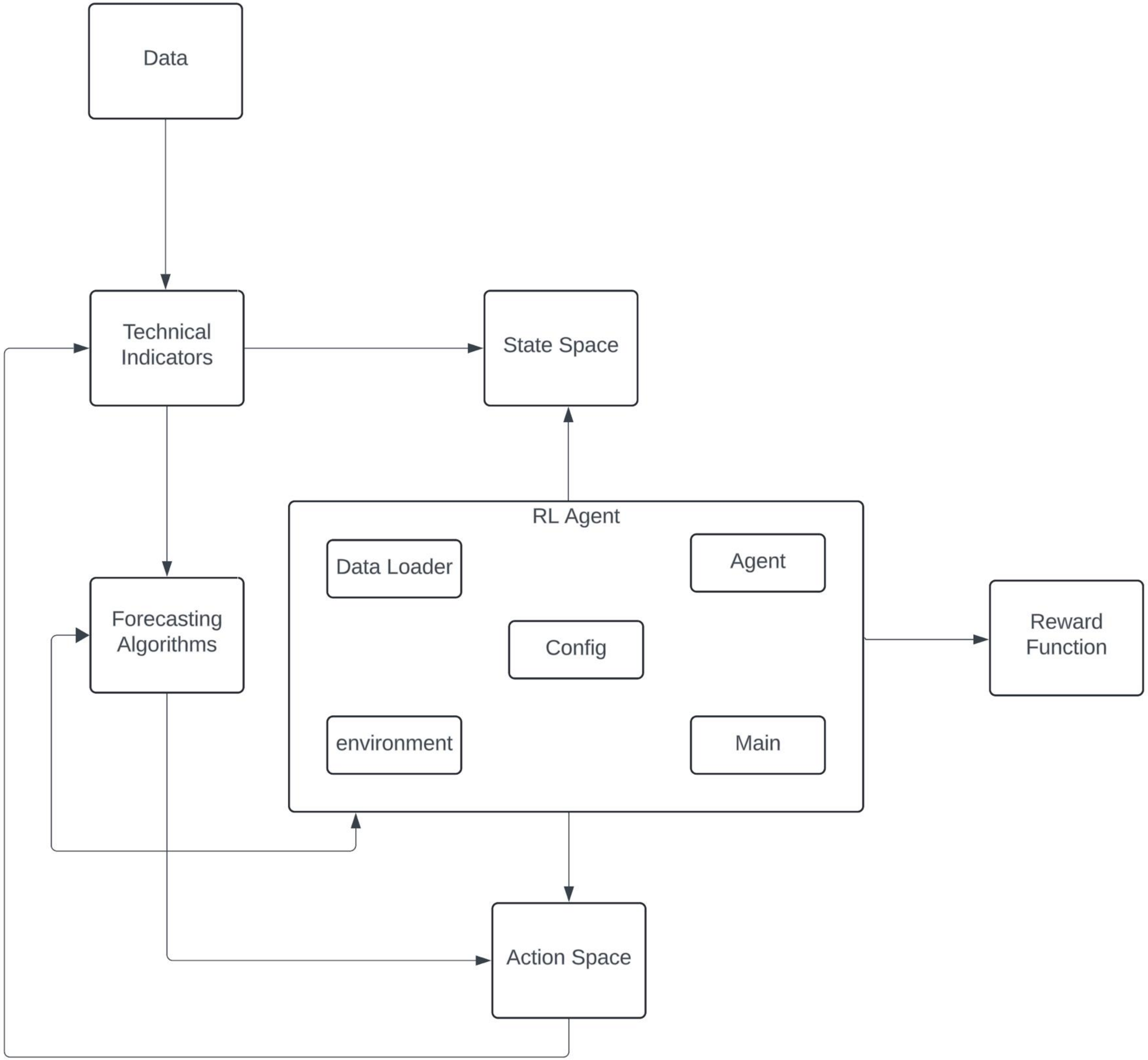
- Overview
- Updated Domain and architecture Models
- Deliverables
- Gantt Chart

Overview

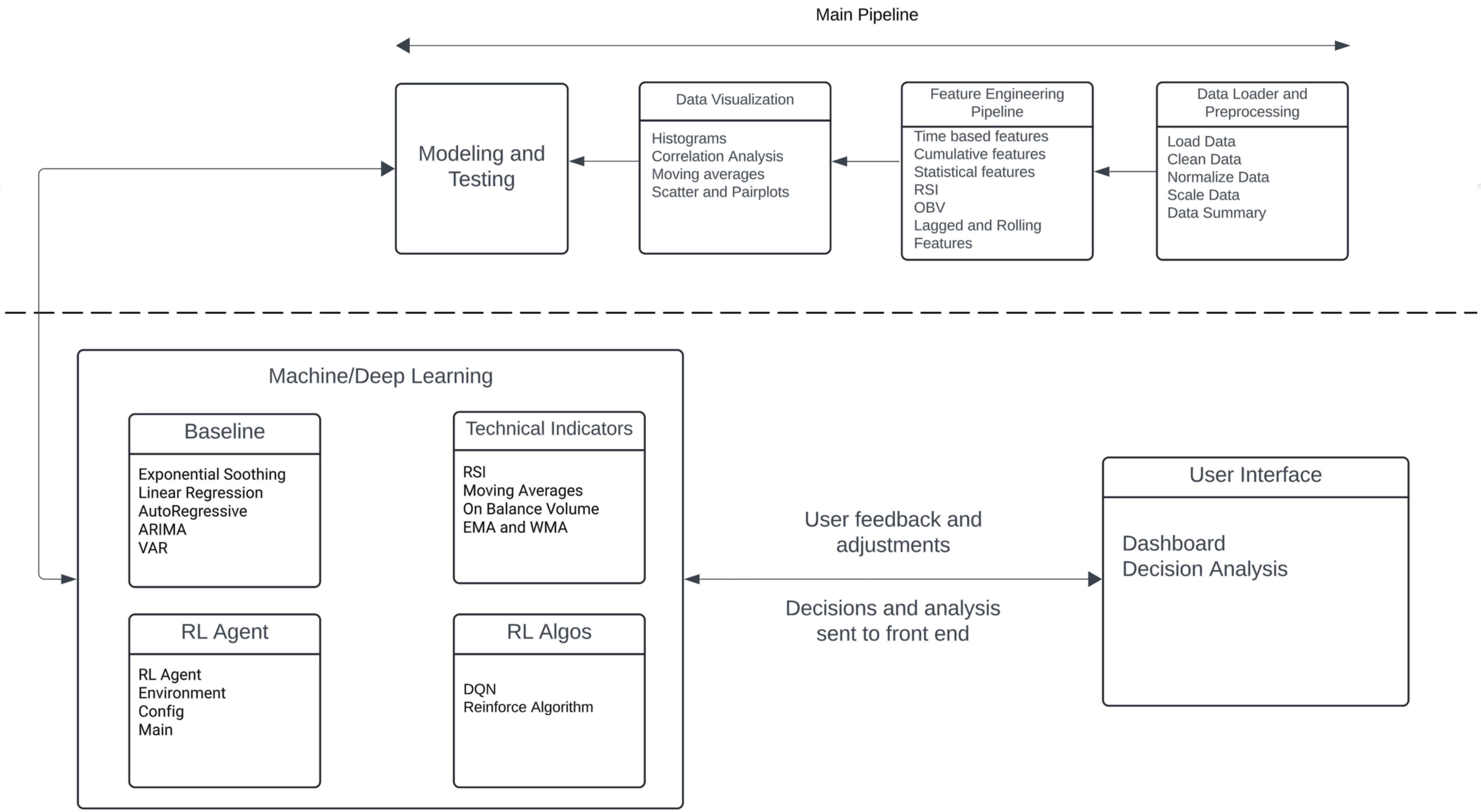
Proposed Project

- Develop an agent to learn trading strategies for the DJI stocks leveraging reinforcement learning.
- Create a system that can adapt to market changes and optimize strategic decisions in real time aiming to maximize returns.
- Evaluate trading strategy performances using metrics and choose which the model will use.

Domain Model


Data
Technical Indicators
State Space
Forecasting Algorithms
RL Agent
Data Loader
Agent
Config
environment
Main
Reward Function
Action Space

Architecture Model


Main Pipeline
Modeling and Testing
Data Visualization
Histograms
Correlation Analysis
Moving averages
Scatter and Pairplots
Feature Engineering Pipeline
Time based features
Cumulative features
Statistical features
RSI
OBV
Lagged and Rolling Features
Data Loader and Preprocessing
Load Data
Clean Data
Normalize Data
Scale Data
Data Summary
Machine/Deep Learning
Baseline
Exponential Soothing
Linear Regression
AutoRegressive
ARIMA
VAR
Technical Indicators
RSI
Moving Averages
On Balance Volume
EMA and WMA
RL Agent
RL Agent
Environment
Config
Main
RL Algos
DQN
Reinforce Algorithm
User feedback and adjustments
Decisions and analysis sent to front end
User Interface
Dashboard
Decision Analysis

GitHub and Demo

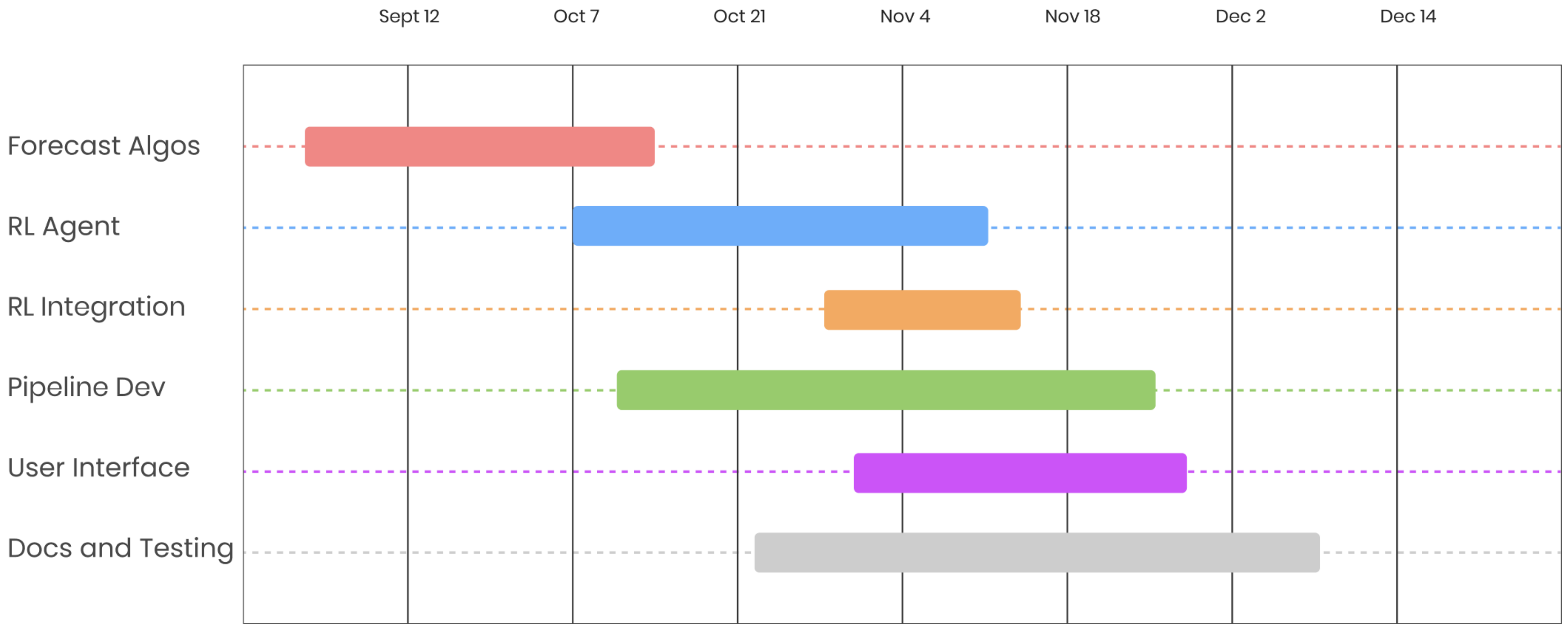
Deliverables

- Reinforcement Learning Algos
  - DQN
  - Reinforce
- Pipeline Dev
  - Modeling Pipeline [in progress]
  - UI ideation started

Deliverables By Stand up III

- Finalize RL algorithm
- Integration of TSA and RL
- Basic UI for the project – frameworks and prototype

Gantt Chart



Sept 12
Oct 7
Oct 21
Nov 4
Nov 18
Dec 2
Dec 14
Forecast Algos
RL Agent
RL Integration
Pipeline Dev
User Interface
Docs and Testing

Thank you