

AI in Finance (Applied-Research Collaboration Project with Joint Research Papers Publication) Using AI on the Ontology for Intelligent Big Data Visualization



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To predict the future price, the commonly used statistical or AI methods include correlation analysis, time series, regression analysis, etc. These methods mainly focus on numerical data for price prediction. However, a recent study found that future price is sensitive to the news and social media. A good example is the GameStop and AMC stocks going up and down sharply in 2021 after the frequent social media and news discussions. ImpactInvest Limited, which is a fund investment company, collaborated with HKU SAAS Data Science Lab in 2021 to explore how AI can be used to detect the market patterns and its correlated information accurately.

To learn the market behaviours and scenarios, HKU SAAS Data Science Lab developed an ontology-based 2D/3D clustered CNN model for price prediction, and built a big data visualization tool for visualizing the related news, prices, and other factors in a dashboard. The Data Science Lab collected the 10 years import and export trading data, environmental data, news data, and future price data of five crops in China, India, Thailand, Russian Federation, Australia and United States market for building the AI-based big data visualisation tool to predict the future market trend, and to visualise the correlated information.

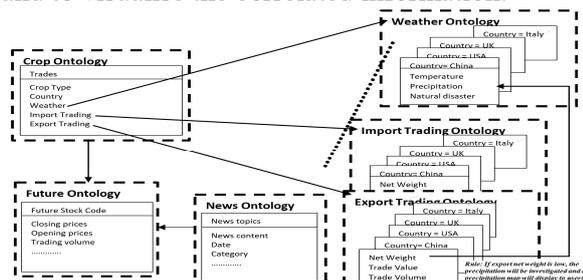


Figure 1 An ontology to describe the relationships between and within the data objects.

“With the big data visualisation, it can help fund manager to identify the related information for further analysis. As information overload is one of the greatest challenges to us, this tool can help us to shorten the information searching time for performing quicker response to the market changes,” said Mr Rogers Chan, Partner of ImpactInvest Limited.

An ontology was built to describe the relationships of the news, prices, environmental factors, etc (see Figure 1). An ontology-based clustered 2D/3D CNN architecture was implemented to learn the historical price pattern (see Figure 2). The trained model can predict the future prices and the related information is extracted based on the ontology rules in the dashboard (see Figure 3).

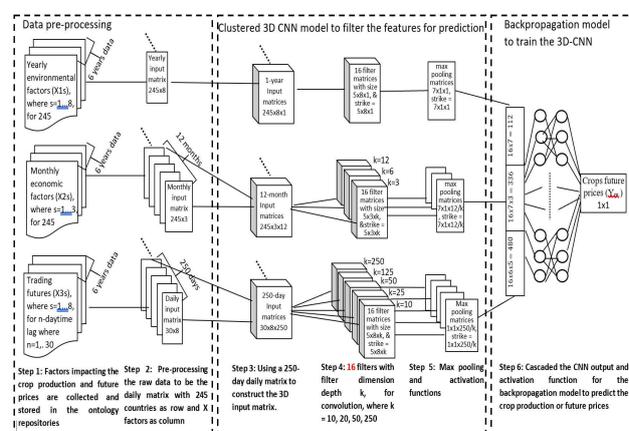


Figure 2 An overview of the ontology-based clustered CNN architecture.

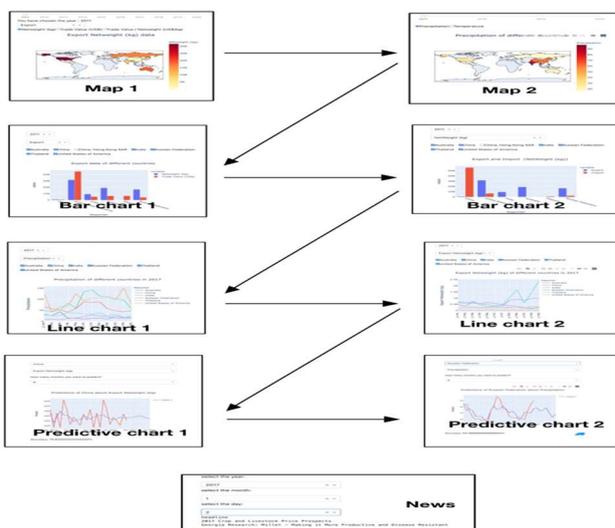


Figure 3 A dashboard to overview the related future prices, environmental factors, and related factors.

“Currently, the clustered 2D-CNN and 3D-CNN for price prediction was implemented. We have trained the model with big data including news, predicted price, and economic factors. A few applied-research papers had been or will be published based on findings from this project,” said Dr Adela Lau, Deputy Director of HKU SAAS Data Science Lab.