BitProphet

---- A Project for Bitcoin Prediction

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01

PART ONE
Background

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COMPUTER SCIENCE & ENGINEERING
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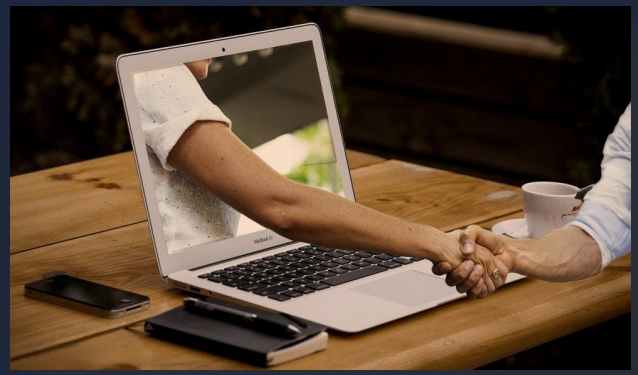
Bitcoin

An essential part of **WEB 3.0**

Trade without a third-party



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PART TWO
Data Intro

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Bitcoin Datasets

Only Price Trend?
Too simple 😫

Background

Data Intro

Plans

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Bitcoin Datasets

External Features?

Evaluation Metrics?

Background

Data Intro

Plans

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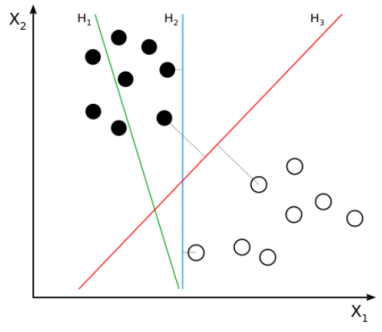
PART THREE
Plans

Models

LinearSVR (regression version of SVM)

What is it: A kind of **regression** machine learning method, trying to find the **best hyperplane** which would get **max margin** among all data points.

Why choose it: **Simple ≠ Bad!** We want to see how well a simple machine-learning model behaves in predicting complex time series data, and according to previous experience it may give us a surprise!



H1 can't separate the categories. H2 can, but only at very small intervals. H3 separates them at maximum spacing.

Table 13
Performance comparison against the benchmark.

Models	LSTM*	LSTM	RNN*	QDA	SVM	RF	XGB	ARIMA*	LR	LDA
Accuracy	0.528*	0.570	0.502*	0.551	0.653	0.510	0.483	0.500*	0.660	0.639
Precision	0.355*	0.552	0.391*	0.522	0.708	0.493	0.455	1.00*	0.723	0.680

*Denotes the benchmark methods and results of McNally [15].

From:Bitcoin price prediction using machine learning: An approach to sample dimension engineering(Zheshi Chen)

Models

Hidden Markov Model: Predict Hidden Feature From Visible Feature

Table 4.5: The Distribution of Absolute Prediction Errors

	LSTM	GRU	GMMHMM	GaussianHMM
Mean	39.2422	25.8095	21.6315	21.8164
Standard Deviation	38.4952	34.3891	30.6148	30.8758
Min	0.0086	0.0025	0.0003	0.0013
25%	17.4294	8.1889	6.6154	6.4539
50%	30.6605	16.7220	13.6135	13.9382
75%	49.5708	31.9816	26.7994	27.3862
95%	97.2273	76.3918	64.0733	63.4393
97.5%	128.4093	104.0899	88.6742	87.1146
Max	1528.5816	1706.9937	1698.2208	1744.5792

HMM can

- **Catch the feature of the hidden state by evaluating visible features.**
- **Has a relatively smaller error for prediction.**

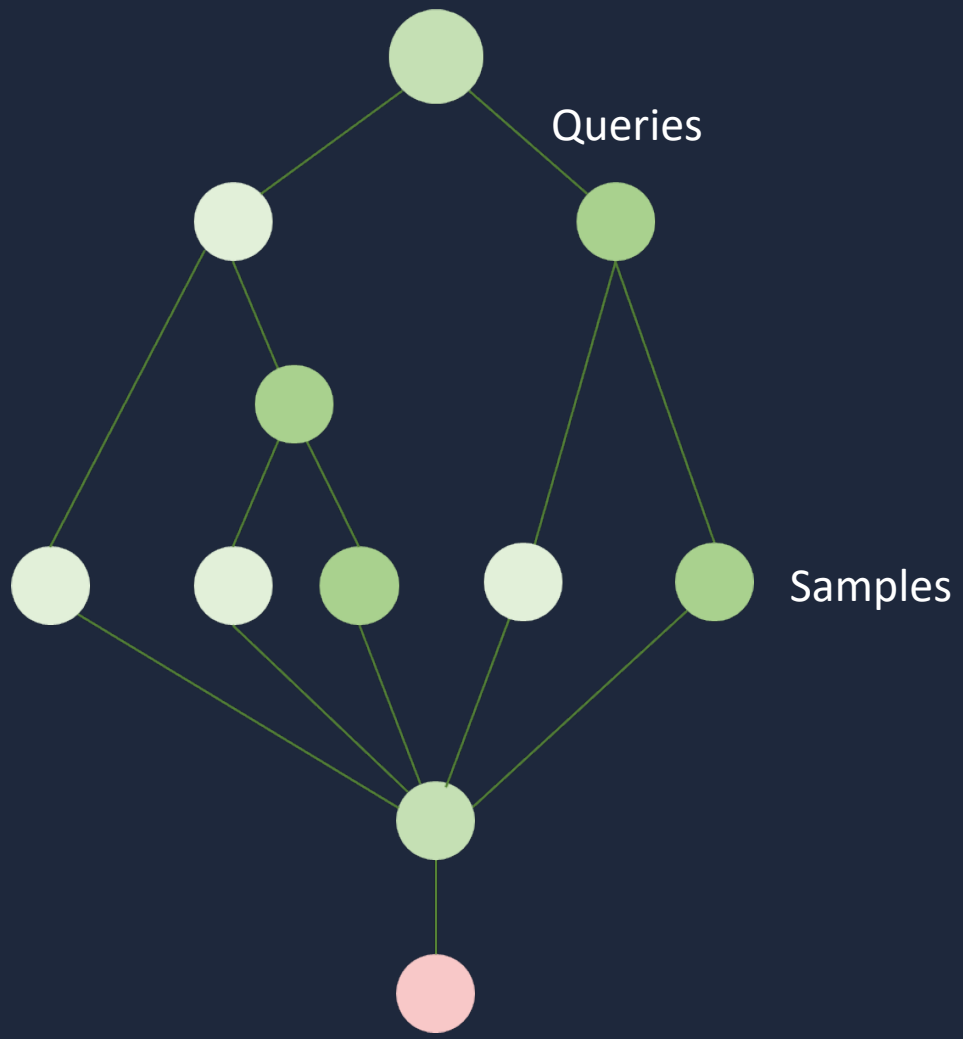
Models

GBDT: Gradient Boosting Decision Tree

Use a lot of tree models to predict residuals.

Using square errors instead of Gini index.

machine learning algorithms VS deep learning.



Models

LSTM (Long-Short Term Memory)

- a neural network method for identifying patterns in data sequences such as numerical time series data.
- the highly nonlinear and volatile character of bitcoin data.
- accuracy and performance.

Table 4. Comparison between the proposed method and several existing methods.

	Algorithm	Accuracy (%)
Proposed Method	LSTM	95%
Paper (Albariqi & Winarko, 2020)	MLP	81.3%
	RNN	77.3%
Paper (McNally et al., 2018)	ARIMA	50.05%
	LSTM	52.78%
	RNN	50.25%

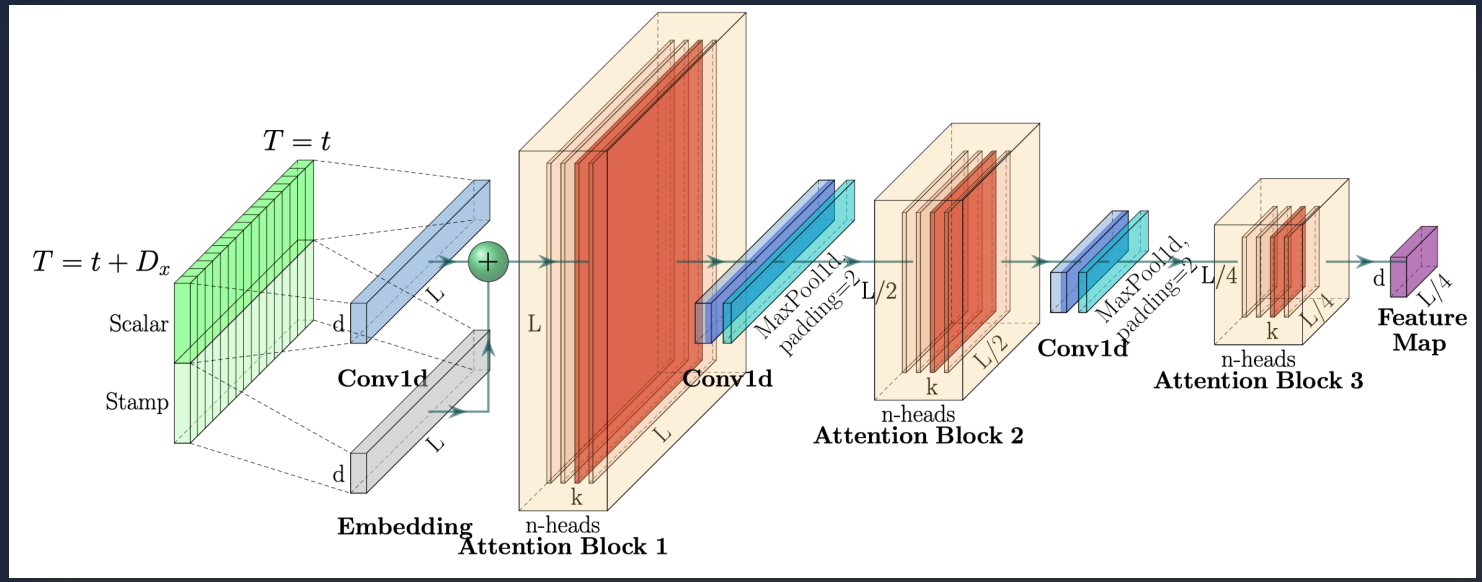
Table 3. Paper (McNally et al., 2018) *models' comparison*

	LSTM	RNN	ARIMA
Accuracy	52.78%	50.25%	50.05%
RMSE	6.87%	5.45%	53.74%
Learning Algorithm	RMSprop	RMSprop	-
Hidden State Size	20	20	-
Dropout	0.5	0.5	-
Window size	100	24	-

Models

Informer: Beyond Efficient Transformer for Long Sequence Time-Series Forecasting

AAAI'21 Best Paper



Why Informer?

- **Attention is all you need!**
- **Superior performance in capturing long-range dependency**

THANK YOU

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