

# Generate Explanations for Time-series classification by ChatGPT

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## Outlines

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- Motivation
- Reason of using ChatGPT
- A preliminary experiment
- Methodology
- Evaluation

# Motivation

■ Problem: Current methods to explain time series are **not user-friendly** for **non-researchers**.

■ Idea: Use **ChatGPT** to explain the classification

■ Benefit:

- User-friendly and easy-accessible.
- Link features to knowledge in other fields.

```
value_ar_coefficient_coeff_10_k_10  
value_mean_second_derivative_central  
CO_trev_1_num  
value_change_quantiles_f_agg "mean" isabs_False_qh_1.0_ql_0.8  
value_agg_linear_trend_attr "slope" chunk_len_10_f_agg "var"  
value_agg_linear_trend_attr "slope" chunk_len_5_f_agg "var"  
value_large standard deviation r 0,45
```



# Reason of using ChatGPT

## Related Works

### ■ Forecasting via Prompt

- Prompt-based method > numerical-based in forecasting time-series data
- Big advantage in zero-shot (RMSE: 70 vs 7)

### ■ Casual inference

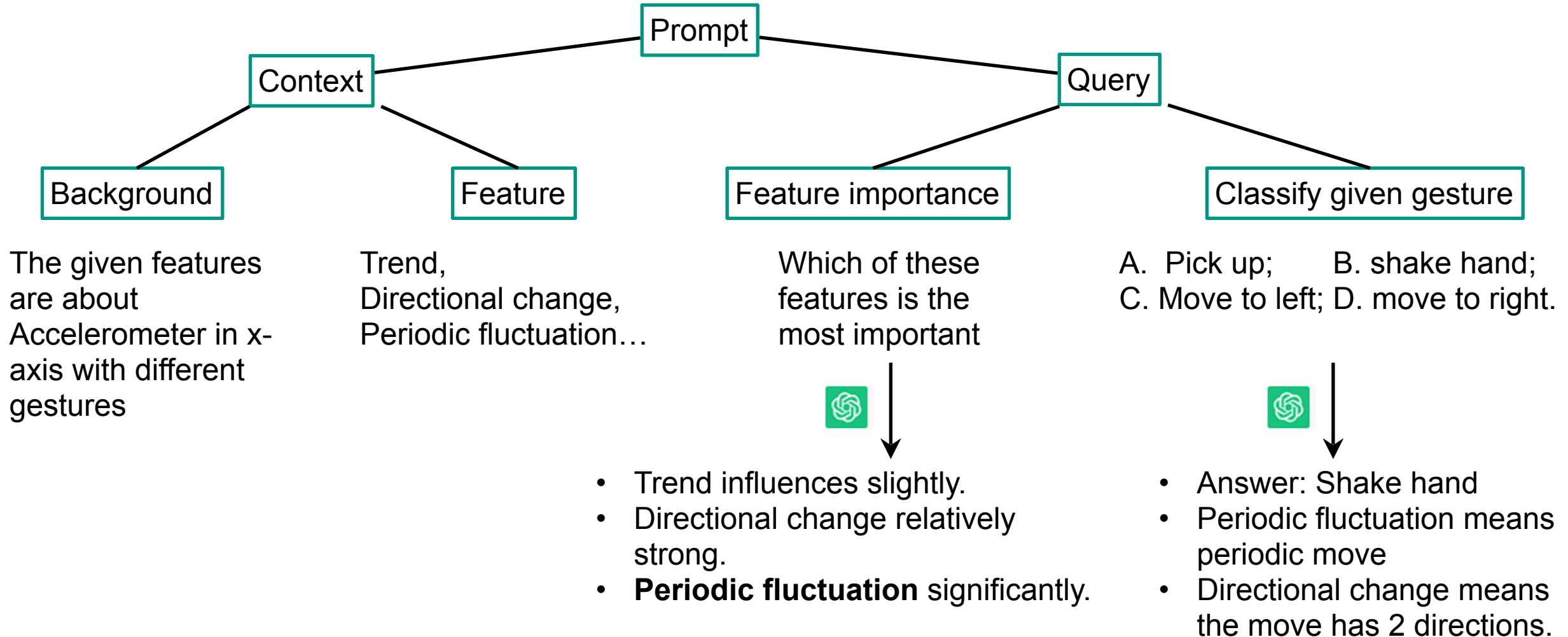
- GPT can generate causal graphs in a high accuracy (about 70%)
- Helpful in combining domain knowledge to classification.



PROMPTCAST: A NEW PROMPT-BASED LEARNING PARADIGM FOR TIME SERIES FORECASTING, Hao Xue, Flora D. Salim, <https://arxiv.org/abs/2210.08964>  
Can Large Language Models Build Causal Graphs?, Stephanie Long, Tibor Schuster, Alexandre Piché, <https://arxiv.org/abs/2303.05279>

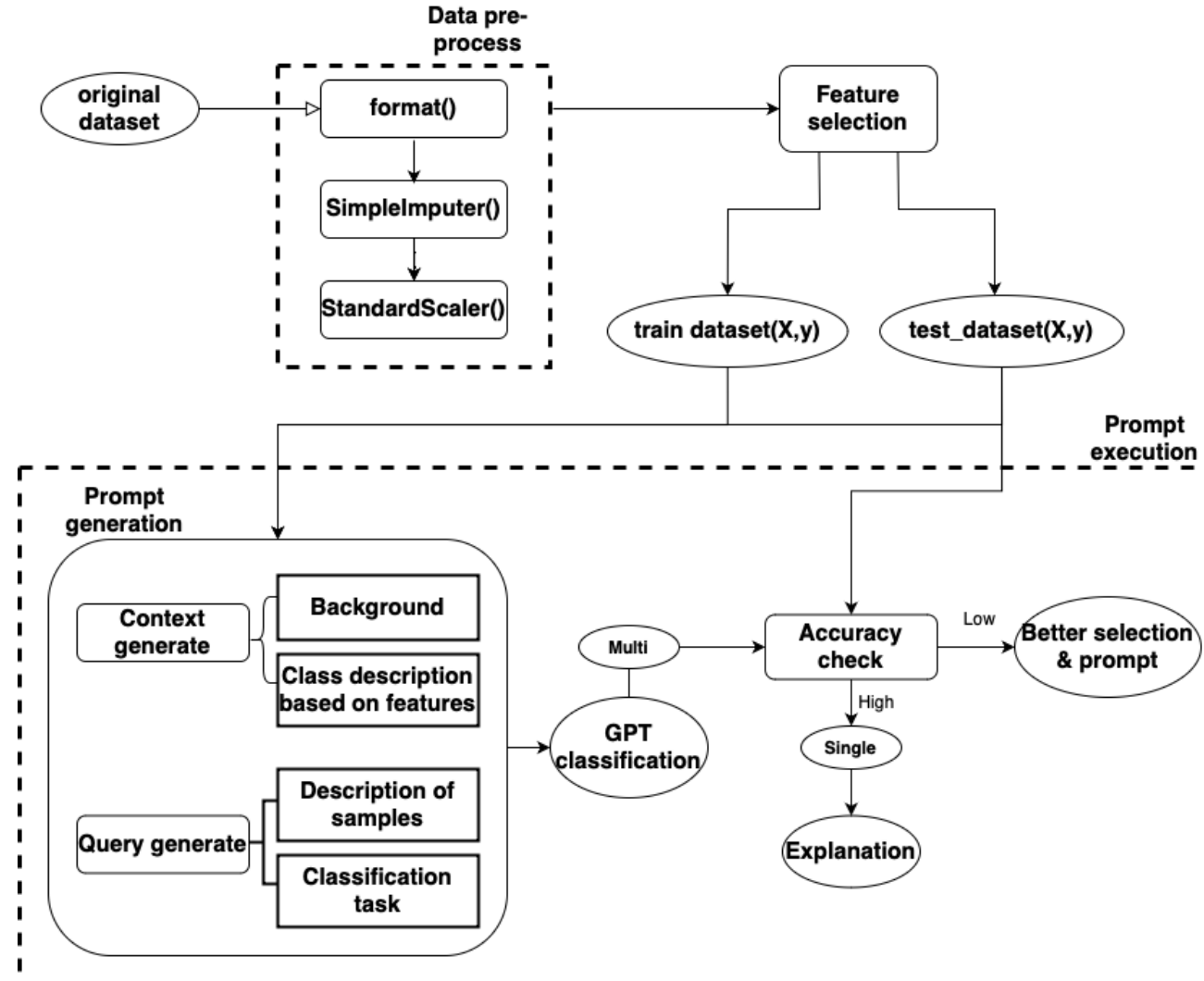
# A preliminary experiment

Accelerometer in x-axis with different gestures



# Methodology

## General pipeline



## Evaluation

- Research object: Time-series datasets about human activity recognition
  - basic movement (pick up, shake...)
- Target:
  - Intuitively understandable explanation
  - Stable desired answer
    - Better prompt, avoiding incorrect answer or unwished format
  - Prove to be reliable and logical