Attention based simplified deep residual network for citywide crowd flows prediction

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Problems & Method

- **Problem**: The goal of the problem is to predict the number of incoming and outgoing people of regions in a city.
- **Method:**
  - We propose a simplified deep residual network by removing redundant branches and simplifying three-way branches into one network structure.
  - We adopt the spatio-temporal attention mechanism to further improve prediction performance.

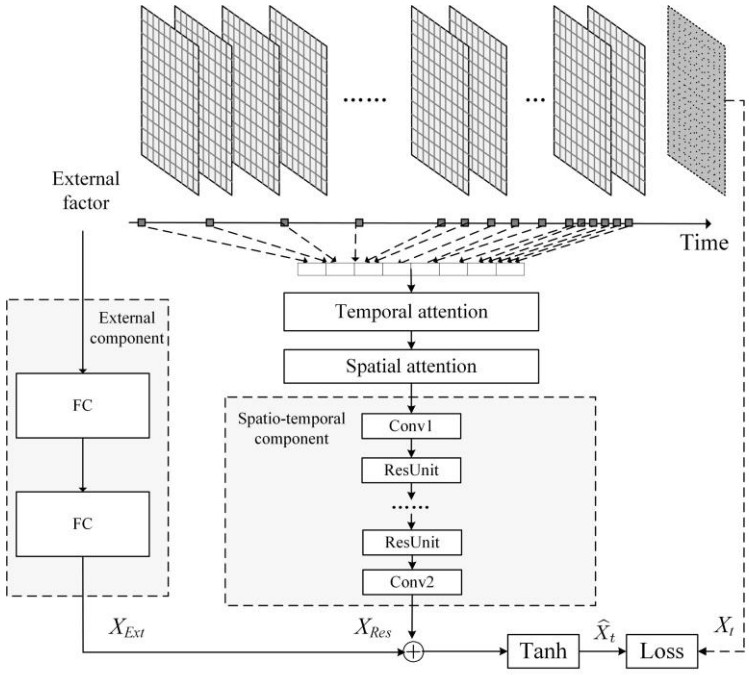

Fig.1. The architecture of our method

Main Experiment Results

Our methods can obtain not only less training time but also competitive prediction performance compared with baselines, as shown in Table 1,2.

Table 1 Comparison among different methods

Methods	RMSE	
	TaxiBJ	BikeNYC
ARIMA	22.78	10.07
SARIMA	26.88	10.56
VAR	22.88	9.92
DeepST	18.18	7.43
ST-ResNet	16.69	6.33
Simplified method	16.32	6.33
Enhanced method	**16.04**	**5.96**

Table 2 Time consumptions of training time

Methods	Time consumptions(s)	
	TaxiBJ	BikeNYC
ST-ResNet	5925.038	476.894
Simplified method	2214.128	196.407
Enhanced method	2395.781	260.891