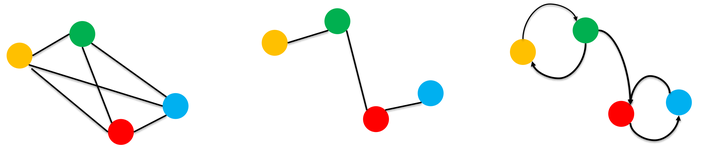
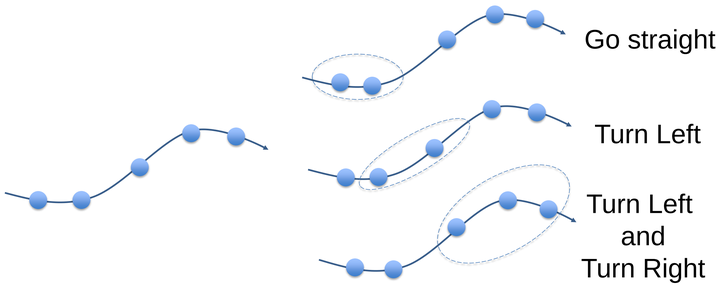
SGCN：Sparse Graph Convolution Network for Pedestrian Trajectory Prediction

Liushuai Shi[1], Le Wang[1], Chengjiang Long[2], Sanping Zhou[1], Mo Zhou[1], Zhenxing Niu[3], Gang Hua[4]
[1]Xi'an Jiaotong University, [2]JD Finance America Corporation, [3]Alibaba Group, [4]Wormpex AI Research

Motivation



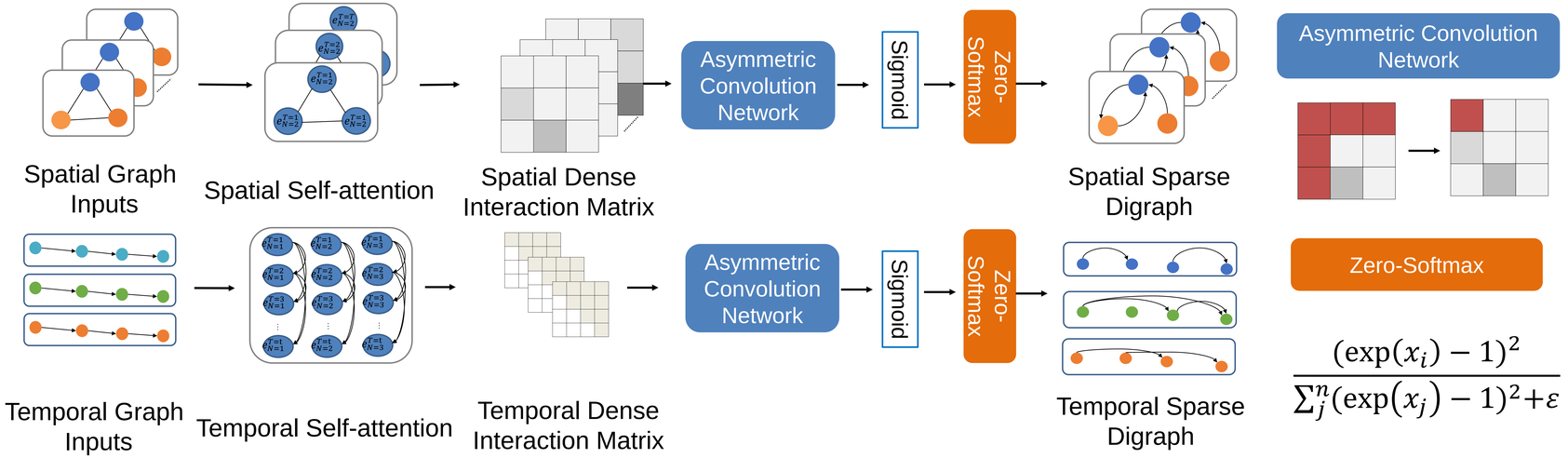
Dense Undirected Interaction | Sparse Undirected Interaction | Sparse Directed Interaction



Trajectory Sequence | Multiple Motion Tendencies

- Pedestrian **hardly** interacts with all other pedestrians of the scenario.
- The future trajectories are effected by **a little of** motion tendency.
- Removing the **superfluous interactions and trajectory points**, spatial and temporal sparse digraph are built.

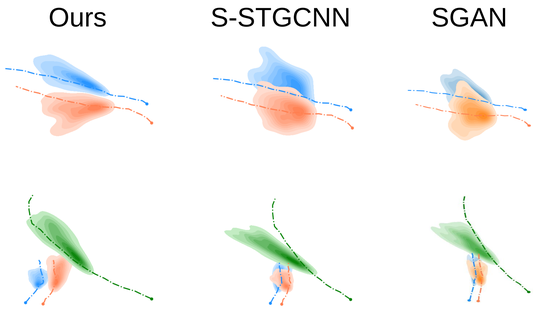
Sparse Graph Learning



Experimental Results

	ADE/FDE
S-LSTM	0.72/1.54
SGAN	0.61/1.21
S-BIGAT	0.48/1.00
S-STGCNN	0.41/0.87
Ours	**0.37/0.65**

Performance on ETH and UCY dataset



Visualization of predicted distribution

Conclusion

By modeling the spatial sparse digraph and temporal sparse digraph, SGCN can learn the effective interaction objects and motion tendencies to improve the accuracy of trajectory prediction.

Code & Paper