CLAIMS

What is claimed is:

1. A method for predicting a node state, comprising:

obtaining static graphs and dynamic graphs of a plurality of nodes in a target network, wherein the static graphs and the dynamic graphs are all topology views;

generating spatial feature data of the plurality of nodes based on the static graphs and the dynamic graphs using a spatial model;

obtaining time feature data of the plurality of nodes using a temporal model, wherein the obtaining time feature data of the plurality of nodes comprises: obtaining observation data of the plurality of nodes in a first historical time range, wherein the first historical time range is a time range before the target time range; slicing the observation data in a time dimension to obtain time slice data, wherein a data amount of the time slice data is less than a data amount of the observation data; and obtaining the time feature data based on the time slice data; and

obtaining a predicted state of a target node in a target time range based on the spatial feature data and the time feature data, wherein the target node is any node in the plurality of nodes.

2. The method according to claim 1, wherein the time slice data comprises:

observation data in a time range that is in the first historical time range and that is adjacent to the target time range.

3. The method according to claim 1 or 2, wherein the time slice data comprises:

observation data in a specific time range in the first historical time range, wherein the specific time range is located in a first period, the target time range is located in a second period, and the specific time range comprises a time range that corresponds to the target time range and that is in the first period.

4. The method according to any one of claims 1 to 3, wherein the obtaining static graphs and dynamic graphs of a plurality of nodes comprises:

obtaining observation data of the plurality of nodes in a second historical time range, wherein the second historical time range is a time range before the target time range; and

constructing the static graphs and the dynamic graphs based on the observation data.

5. The method according to claim 4, wherein the observation data comprises at least one of

the following data:

meteorological data, network topology data, traffic data, voice data, signaling data, point of interest POI data, major-event data, or holiday data.

6. The method according to any one of claims 1 to 5, further comprising:

obtaining a true state of the target node in the target time range; and

training a temporal model and a spatial model based on the true state and the predicted state, wherein the temporal model is used to output the time feature data based on input observation data, and the spatial model is used to output the spatial feature data based on the static graphs and the dynamic graphs that are input.

87. The method according to any one of claims 1 to 5, wherein the static graphs belong to first-type topology views, the dynamic graphs belong to second-type topology views, and a topological relationship change rate of the first-type topology views is less than a topological relationship change rate of the second-type topology views.

8. The method according to any one of claims 1 to 6, wherein the target network is a communications network, the static graphs are topology views representing a traffic-based topological relationship of the plurality of nodes, and the dynamic graphs are topology views representing a physical-line-based topological relationship of the plurality of nodes.

9. An apparatus for predicting a node state, comprising a processing unit configured to:

obtain static graphs and dynamic graphs of a plurality of nodes in a target network, wherein the static graphs and the dynamic graphs are all topology views;

generate spatial feature data of the plurality of nodes based on the static graphs and the dynamic graphs using a spatial model;

obtain time feature data of the plurality of nodes using a temporal model; and

obtain a predicted state of a target node in a target time range based on the spatial feature data and the time feature data, wherein the target node is any node in the plurality of nodes

wherein the apparatus further comprises an input unit, wherein

the input unit is configured to obtain observation data of the plurality of nodes in a first historical time range, wherein the first historical time range is a time range before the target time range;

the processing unit is specifically configured to slice the observation data in a time dimension

to obtain time slice data, wherein a data amount of the time slice data is less than a data amount of the observation data; and obtain the time feature data based on the time slice data.

10. The apparatus according to claim 9, wherein the time slice data comprises:

observation data in a time range that is in the first historical time range and that is adjacent to the target time range.

11. The apparatus according to claim 9 or 10, wherein the time slice data comprises:

observation data in a specific time range in the first historical time range, wherein the specific time range is located in a first period, the target time range is located in a second period, and the specific time range comprises a time range that corresponds to the target time range and that is in the first period.

12. The apparatus according to any one of claims 9 to 11, wherein the apparatus further comprises an input unit, wherein

the input unit is configured to obtain observation data of the plurality of nodes in a second historical time range, wherein the second historical time range is a time range before the target time range; and

the processing unit is specifically configured to construct the static graphs and the dynamic graphs based on the observation data.

13. The apparatus according to claim 12, wherein the observation data comprises at least one of the following data:

meteorological data, network topology data, traffic data, voice data, signaling data, point of interest POI data, major-event data, and holiday data.

14. The apparatus according to any one of claims 9 to 13, wherein the processing unit is further configured to:

obtain a true state of the target node in the target time range; and

train a temporal model and a spatial model based on the true state and the predicted state, wherein the temporal model is used to output the time feature data based on input observation data, and the spatial model is used to output the spatial feature data based on the static graphs and the dynamic graphs that are input.

15. The apparatus according to any one of claims 9 to 14, wherein the static graphs belong to first-type topology views, the dynamic graphs belong to second-type topology views, and a

topological relationship change rate of the first-type topology views is less than a topological relationship change rate of the second-type topology views.

16. The apparatus according to any one of claims 9 to 15, wherein the target network is a communications network, the static graphs are topology views representing a traffic-based topological relationship of the plurality of nodes, and the dynamic graphs are topology views representing a physical-line-based topological relationship of the plurality of nodes.

17. A device for predicting a node state, wherein the device comprises a processor and a memory, the memory is configured to store a computer program, and the processor is configured to invoke and run the computer program from the memory, so as to enable the device to perform the method according to any one of claims 1 to 8.

18. A computer readable storage medium, wherein the computer readable storage medium stores a computer program, and when the computer program is executed by a processor, the processor is enabled to perform the method according to any one of claims 1 to 8.