Manual

1 Overview

This manuscript introduces a tool verifying congestion on WSN, which is modeled by Petri net and Coloured Petri net. The figure below shows UI of the tool on web browser.

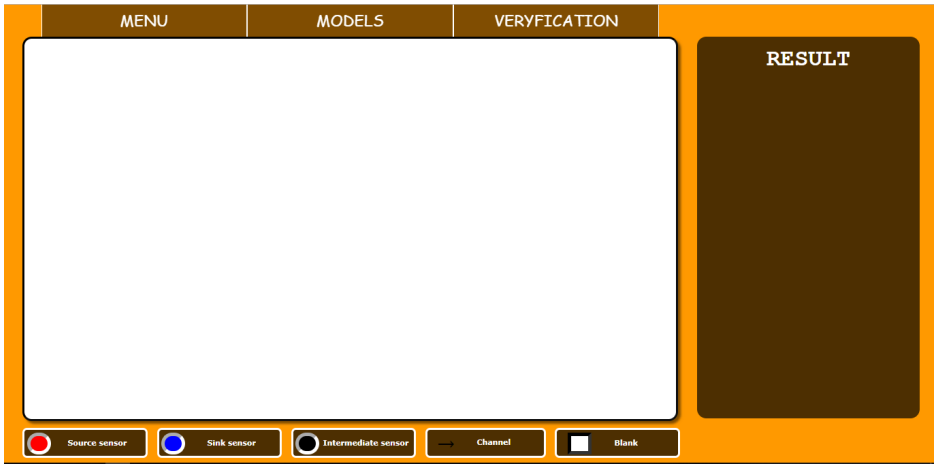

Figure 1: UI

In the next sections, we describe the functions of tool in detail.

2 Design WSN Topology

We draw topology on a canvas. There are three types of sensor: source sensor (red), intermediate sensor (black) and sink sensor (blue).

- To draw a sensor, double click on canvas.
- To set sensor's type, right click on it and choose one.
- To draw a link between two sensors, press "Shift", hold left mouse down and drag from a sensor to another one.

- To move a sensor, choose and drag it around.
- To set parameter for sensor or channel, right click on it and choose "Setting".

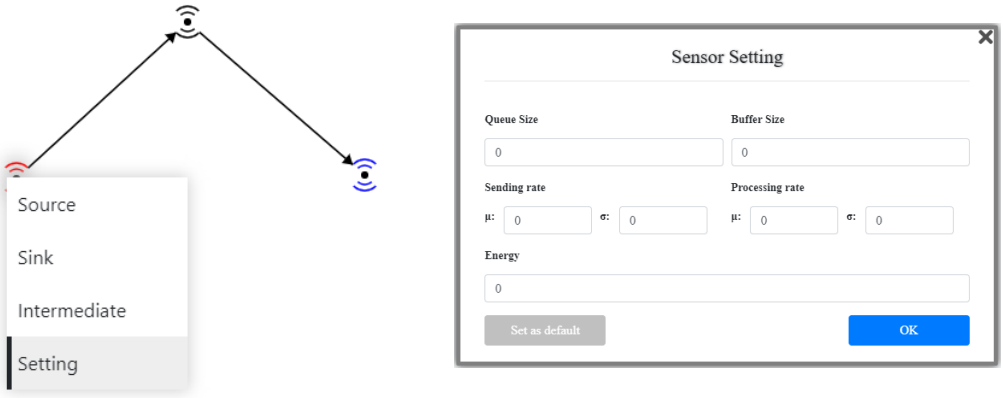

Figure 2: Setting parameter for sensor

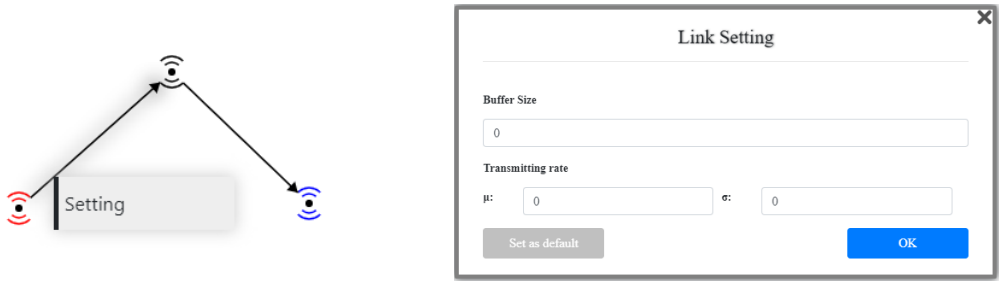

Figure 3: Setting parameter for channel

- To set general parameter for network, right click on canvas and choose "General Setting".

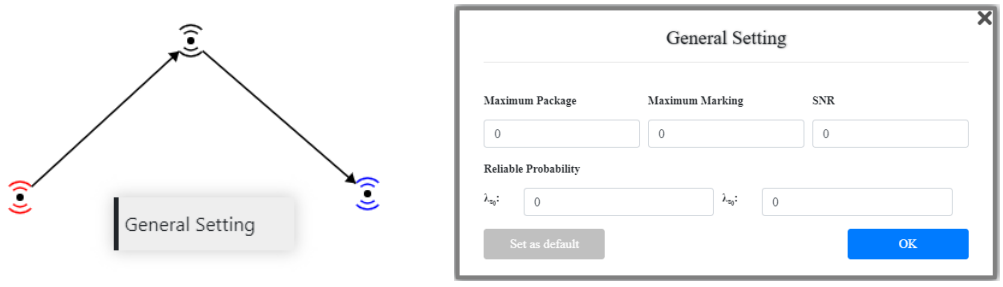

Figure 4: Setting parameter for network

3 Verify

In "Models" tab, there are two options:

- Perti net: the tool generates reachability graph according to Petri net model.
- Coloured Petri net: the tool generates reachability graph according to Coloured Petri net model.

In "Verification" tab, you choose a mode to verify network. At one time, there is only one option enabled depending on which model you choose:

- Congestion Detection: verifying network base on Petri net model without probability.
- Probabilistic Congestion Detection: verifying network base on Coloured Petri net model with probability.
- Multiple Clustering & Verification: Clustering network base on COCA (Congestion-oriented Clustering Algorithm) then verification each cluster. After that, modify each cluster to create a new network. If any cluster have more than a THRESHOLD, go back to the first step and continue do it until we do not have any cluster.

4 Export and Import

You can select these options in tab "Menu".

- "Import" allows you upload a file "kwsn", then the tool draws topology on canvas.
- "Export" allows you download a file "pnml" if you choose Petri net model and "cpnml" if you choose Coloure Petri net model.