

Xcos Automatic Layout

Xcos - Optimal Link Style

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1 Design

1.1 Workflow

- 1) Change the style of links one by one in a loop.
- 2) Check the two points are aligned and there are no blocks between them. If so, make the link with straight style and without turning points.
- 3) Otherwise, use two points each of which is a distance away from the port (if it was SplitBlock, use it directly).
- 4) Then start with these two new points, find the route with less turning points if possible.

1.2 Common Files

These file should be modified:

CHANGES_5.6.X

modules/xcos/locales/xcos.pot

xcos/help/en_US/xcos_menu_entries.xml

xcos/help/gui/xcos_menu_entries/en_US/xcos_menu_format_link_style.png

xcos/help/images/xcos_menu_entries/en_US/xcos_link_optimal_en_US.png

modules/xcos/locales/fr_FR.po

xcos/help/fr_FR/xcos_menu_entries.xml

xcos/help/gui/xcos_menu_entries/fr_FR/xcos_menu_format_link_style.png

xcos/help/images/xcos_menu_entries/fr_FR/xcos_link_optimal_fr_FR.png

1.3 Relative Files

Create:

org.scilab.modules.xcos.link.actions.StyleOptimalAction.java

org.scilab.modules.xcos.utils.XcosRoute.jav

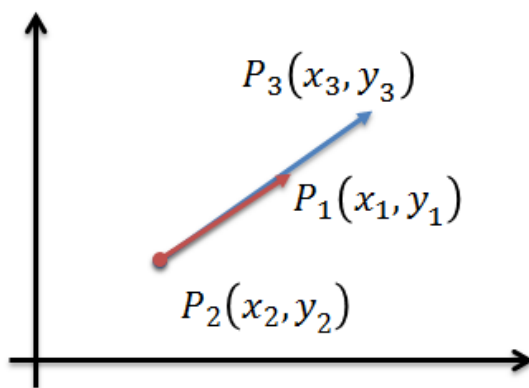
Modify:

```
org.scilab.modules.xcos.XcosTab.java
org.scilab.modules.xcos.link.BasicLink.java
org.scilab.modules.xcos.link.actions.StyleAction.java
org.scilab.modules.xcos.utils.XcosMessages.java
```

2 Implementation

2.1 Mathematic Models

2.1.1 Check Point in Line Segment



$$P_2(x_2, y_2)$$

$$\angle \overrightarrow{P_2P_1} = \angle \overrightarrow{P_2P_3}$$

$$\frac{y_1 - y_2}{x_1 - x_2} = \frac{y_3 - y_2}{x_3 - x_2}$$

$$(y_1 - y_2) \times (x_3 - x_2) = (y_3 - y_2) \times (x_1 - x_2)$$

$$\min(x_2, x_3) \leq x_1 \leq \max(x_2, x_3)$$

$$\min(y_2, y_3) \leq y_1 \leq \max(y_2, y_3)$$

3 Screenshot

This is the screenshot for the help.

<u>H</u> orizontal	H
<u>S</u> traight	S
<u>V</u> ertical	V
<u>O</u> ptimal	O

This menu allows to change the style of the link.
First select the link and select the appropriate menu item or use the shortcuts (*H*), (*S*), (*V*), (*O*). The following list shows the results obtained.

- Horizontal (*H*)



- Straight (*S*)



- Vertical (*V*)



- Optimal (*O*)

