

VisualMinSpanningTree

User Guide for New Users

Draw a Graph

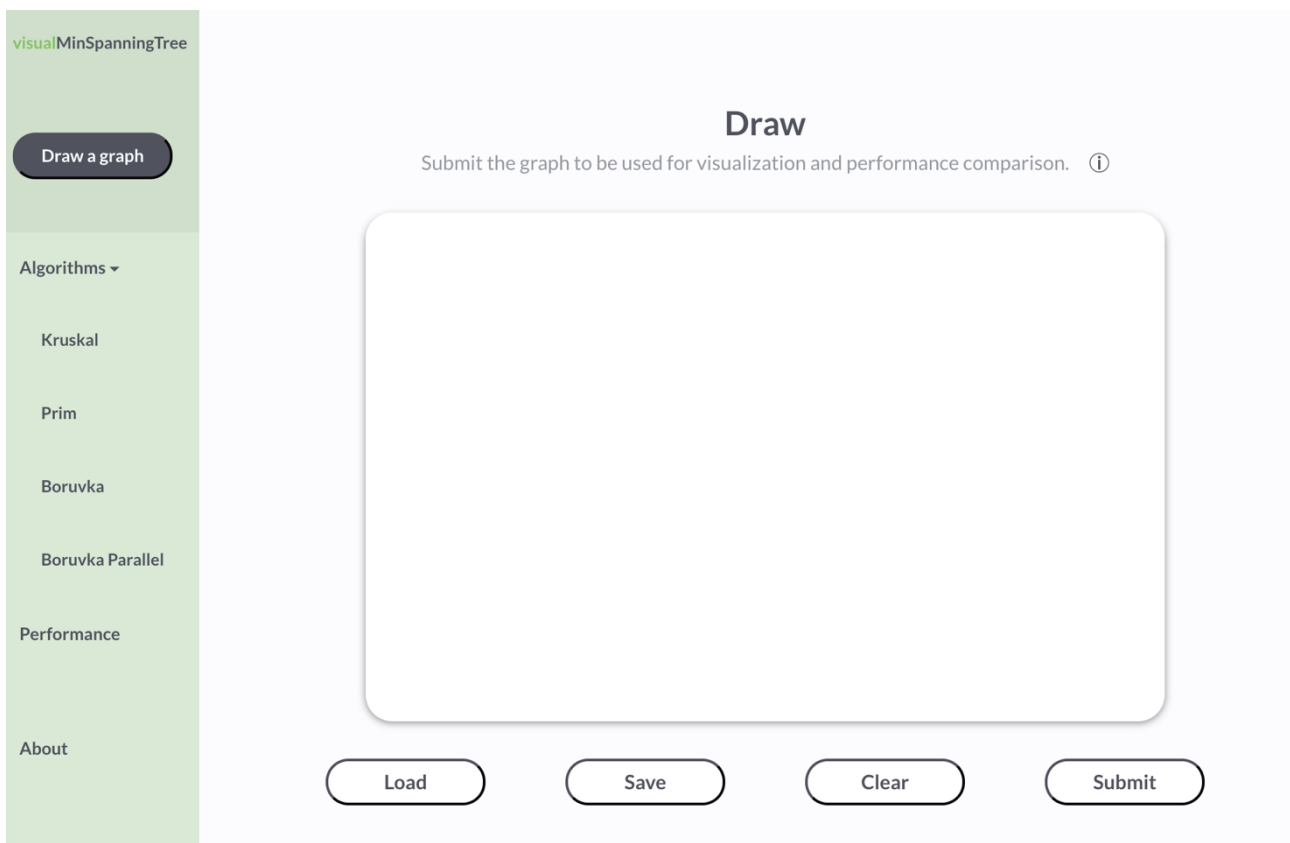
The software allows the creation/drawing of the graph. User can draw a graph according to the following instructions:

- Double click on empty space to create a node.
- Drag from vertex to vertex to create an edge.
- Right click on edge or node to delete it.
- Click on the weight and you can manually change with a new weight.

*Constraints are imposed when creating the graph: the graph must be a spanning tree, that is a directed graph with all vertices connected.

The draw screen also provides other functionalities:

- **Load:** Click on “Load” button to load an old graph from the database.
- **Save:** Click on “Save” button to save the current graph (name must be provided for the graph)
- **Clear:** Clear everything that is drawn on the canvas.
- **Submit:** In order to see the computation of different algorithms of the current graph, must click on “Submit”.



Algorithm Visualization

The screenshot shows a web application titled 'visualMinSpanningTree'. On the left is a sidebar with a 'Draw a graph' button and a list of algorithms: 'Algorithms', 'Kruskal', 'Prim', 'Boruvka', 'Boruvka Parallel', 'Performance', and 'About'. The main area is titled 'Kruskal' and contains two panels. The left panel shows a graph with three nodes and three edges with weights 7, 12, and 10. The right panel displays the pseudocode for Kruskal's algorithm: 'Sort the edge list E by weight (smallest first)', 'Initialize the set T = empty set', 'for (i=0; i<edgeList.length; i++)', 'e = edgelist[i]', 'if adding e to T is acyclic', 'add e to T', 'else do nothing', 'return T'. Below the panels is a player control bar with buttons for previous, play, and next, and a progress slider.

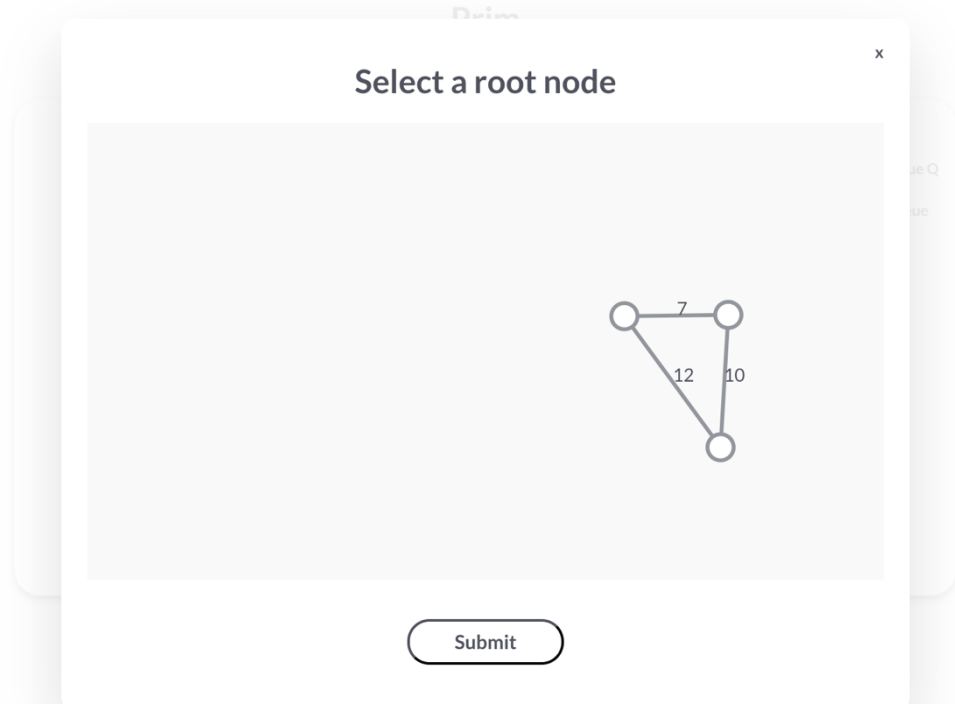
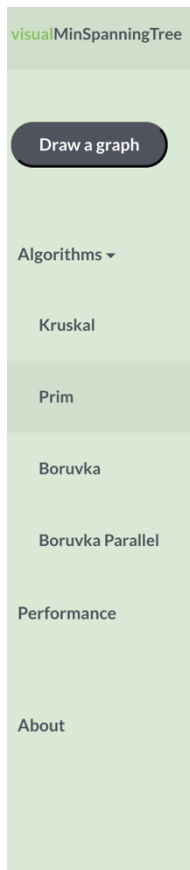
The software allows the visualization of different graph algorithms.

The left canvas shows the graph and the right canvas shows the pseudocode of the algorithm.

After a graph is submitted, click on “Start” button and a player control will be displayed.

The diagram illustrates the controls of the algorithm visualization player. It features three boxes with arrows pointing to specific controls in the player interface:

- “Play”:** when is clicked, will be replaced by “Pause” and start an automatic visualization of the algorithm. “Pause”: stop the automatic visualization of the algorithm. (Points to the play/pause button)
- Record the step of the algorithm,** but the green point can also be dragged forward and backward (algorithm visualization will change accordingly). (Points to the progress slider)
- By clicking on “Previous” or “Next”,** the previous or the next step of the algorithm will be displayed. (Points to the previous/next buttons)

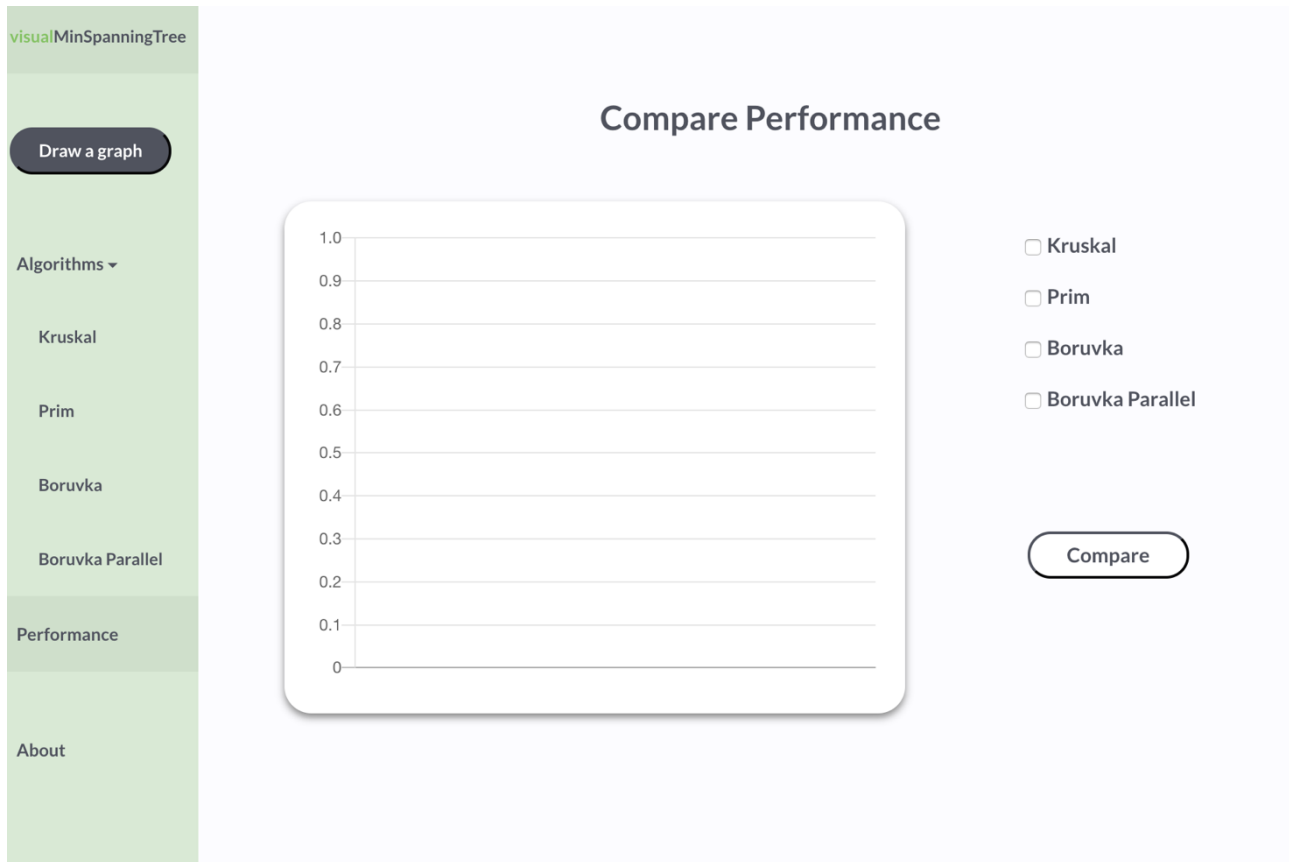


In the Prim screen, user must select a root node for the computation of the Prim's algorithm. User can do it by just clicking on a random node and Submit it.

Color legends for the graph visualization:

- **Red:** edge or node is highlighted, the one which is now considering.
- **Green:** edge that is part of the minimum spanning tree.
- **Grey:** not considered and not part of the minimum spanning tree.

Compare Performance



The software allows the comparison of the performance of different graphs. User can check different checkboxes and by clicking on “Compare”, a line graph will be displayed.