SUMMER FELLOWSHIP REPORT

ON

ESIM ON CLOUD
Improving UI/UX, Management features and adding KiCad Compatibility

Submitted by

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Contents

1 Abstract:

This report presents the implementation details and challenges faced in developing the copy and paste functionality for the Circuit. The primary goal of this feature was to enable users to copy and paste circuit components within the circuit area using the Ctrl+C and Ctrl+V shortcuts. The implementation involved converting the selected component into XML for copying and converting the XML back into a component for pasting. However, due to limitations in retrieving pin properties from the copied XML, the final functionality was not fully realized. This report provides a comprehensive overview of the implemented features, challenges encountered, and recommendations for future improvements.

2 Introduction:

The copy and paste functionality is an essential feature for enhancing user experience and productivity . By enabling users to duplicate and reuse circuit components, this feature streamlines the circuit designing process. This report details the implementation process, challenges faced, and potential solutions for the copy and paste functionality.

3 Implementation Overview:

The copy and paste functionality was implemented using the mxGraph module, which provides a graphical representation of the circuit and supports various interactions. Each component in the circuit is represented as an mxCell, and the implementation involves converting the selected mxCell into XML format for copying and vice versa for pasting.

3.1 Copy Functionality:

3.1.1 Selection of Components:

- Users can select components on the circuit by interacting with the mxGraph interface.

3.1.2 Conversion to XML:

- When users trigger the copy action (Ctrl+C), the selected components (mxCells) are converted into an XML representation. The XML representation includes essential information about the component, such as its type, position, and properties.

3.1.3 Clipboard Storage:

- The XML representation is stored in the clipboard, ready to be retrieved during the paste operation.

3.2 Paste Functionality:

3.2.1 XML Retrieval:

- When users trigger the paste action (Ctrl+V), the application retrieves the XML data from the clipboard.

3.2.2 Conversion to Components:

- The retrieved XML data is parsed and converted back into mxCells or the corresponding components in the mxGraph library. This involves recreating the components with the same attributes and properties as the copied ones. However, due to limitations in retrieving pin properties from the XML, it was not possible to connect the pasted component with the rest of the circuit.

3.2.3 Rendering on the Circuit:

- The newly created components are added to the mxGraph interface, effectively pasting the copied circuit elements onto the canvas.

4 Approaches:

4.1 Approach 1: Event Listeners

- Explored the use of event listeners to implement the copy and paste functionality.

- Tried to capture the necessary data, such as the component image, using event listeners.

- Challenge: Unable to retrieve the component image, leading to an unsuccessful implementation.

4.2 Approach 2: mxClipboard

- Utilized the mxClipboard functions provided by the mxGraph library.

- Attempted to implement copy and paste functionality using mxClipboard.

- Challenge: Unable to retrieve the component image when using mxClipboard, resulting in an incomplete implementation.

4.3 Approach 3: navigator.clipboard

- Explored using the navigator.clipboard module for copy and paste functionality.

- Challenge: Failed to retrieve the component image, resulting in an incomplete implementation.

4.4 Approach 4: Copy Cells as XML

- Copied the cells from the mxGraph and converted them into XML format.
- Parsed the XML back into the mxGraph to retrieve the component.
- Challenge: Unable to retrieve the pin properties, hindering the complete functionality of the circuit components.

These are the approaches that were attempted but faced challenges in retrieving the necessary information, such as the component image and pin properties, for successful copy and paste functionality.

5 Challenges:

The main challenge encountered during the implementation was the inability to retrieve pin properties from the copied XML. This limitation prevented the successful connection of the pasted component within the circuit. The cause of this issue could be attributed to the complexities involved in representing pin properties in the XML format.

The extensive and undocumented open-source codebase posed challenges during the implementation of the copy and paste functionality. It required considerable time and effort to navigate and understand the various functional parts. Emphasizing the need for comprehensive documentation, future efforts should focus on documenting the codebase to facilitate understanding, maintainability, and effective collaboration among developers.

6 Conclusion:

While the copy and paste functionality for the Circuit was partially implemented, challenges related to retrieving pin properties from the copied XML hindered its full functionality. This report has provided a detailed overview of the implementation process, challenges faced, and recommendations for improving the feature. By addressing the limitations and incorporating the suggested improvements, the copy and paste functionality can be enhanced, providing users with a more seamless circuit designing experience.