Breadboard to Schematic

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Abstract

TODO: Write the abstract.

1. Introduction

Breadboards are an important tool for do-it-yourself hardware designers to quickly test circuit systems. They are easy to assemble, easy to change, and easy to test, so are the tool of choice for the first prototype of many hobbyists and students. A programmatically-drawn, or more likely hand-drawn, schematic diagram is used to prototype the circuit board, but if the circuit is going to be used for high-speed, low-noise, or multiple-production applications, a printed circuit board (PCB) is much more desirable than a breadboard. Our approach to solve this problem was a vision-based tool designed to go from a picture of a breadboard circuit to a file written in a PCB-ready format given by Eagle. Through a variety of approaches, we found the task too large and have implemented pieces of the full pipeline. Them main goal of the project was to transform the information about the circuit that we had in image form (pixel representation) to a different more general representation (component representation).

2. Related Work

TODO

3. The Approach

The problem of translating information from a picture of a circuit to a PCB-friendly file format has two main steps. First, the components must be identified in the image, and second, the components must be placed in a virtual grid representation independent of their relation in the image.

3.1. Segmentation into Circuit Components

TODO

3.2. Virtual Grid Representation

TODO

4. Results

TODO

5. Conclusion

TODO