

# Integrating CAD & CAS Tools with Linear Circuit Analysis

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## ABSTRACT

Linear circuit analysis is an introductory course taught to most engineering students across the country. In the course, students work through DC and AC circuits and obtain an understanding of different techniques to solve a particular circuit. Due to the lack of industrial experience and need for advanced software tools in engineering, the teaching circuit analysis has become purely mathematical and does not provide the students with a deep understanding needed to become an expert circuit designer.

This research proposes to improve a typical first course in linear circuit analysis by incorporating CAD and CAS software tools such as Electronics Workbench MultiSim, OrCad PSpice, and MATLAB into a traditional teaching approach. By deriving the basic laws from observations made with various CAD tools, making modifications to existing software simulations, and using CAS tools to verify results from those simulations, students will be given the opportunity to interact with the material from different perspectives in order to develop a deeper, more intuitive understanding of circuit analysis and its techniques.