

TR3 Ritter, F. (1987). OREO: Orienting electrical circuits for qualitative reasoning, (Tech. Rep.) #6560. BBN Laboratories.

Ritter, F. (1986) "OREO - Adding Orientation to a Dynamic Qualitative Simulation". BBN Technical Report, October. Submitted to Third International Conference on Artificial Intelligence and Education, University of Pittsburgh.

#### Abstract

In order to simulate electrical circuits accurately using a qualitative model, it is necessary to give parts an orientation with respect to the voltage source in the circuit. Mistakes made by beginning students of electricity, such as not finding a short across a part, can often be attributed to incompletely orienting the circuit. Experienced engineers orient circuits successfully, though they usually do not indicate orientations in an explicit way on their circuit diagrams. This paper presents an algorithm for orienting circuits that is based on the way engineers orient circuits. The algorithm can explain its operation. It can recognize shorts, bridge elements, and other paths useful for a quantitative simulation. The algorithm allows qualitative systems to be dynamically altered and is upwardly compatible with quantitative simulations.