

# **Abstract**

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## **Fast RC Circuit Simulation Using Artificial Neural Networks**

Model Order Reduction (MOR) is used to model large scale dynamical systems by reducing their complexity, while preserving their input-output behavior as much as possible, as it tries to quickly capture the essential features of a structure. This means that in an early stage of the process, the most basic properties of the original model must already be presented in the smaller approximation. This thesis presents a new technique for modeling RC and RLC Tree circuits using Artificial Neural Networks and Sparse Coding Techniques and compare them with the Spice model results.