
Electrical & Computer Engineering

SEMINAR

Louisiana State University

DPI/SFG: A Systematic Approach to Linear Circuit Analysis Using Signal Flow Graphs and Driving Point Impedance

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Abstract—Hand analysis of linear circuits quickly becomes cumbersome with complexity. This is especially true with circuits having feedback. As a consequence, the process of analog circuit design can become one of iteration on a circuit simulator. Such a process, while effective in “testing” variations, does not “teach” circuit properties well. In this seminar, a new approach to circuit analysis is presented that is useful in circuit property exploration and in circuit development. Using superposition and Driving Point Impedance, a signal flow graph is developed directly from the circuit topology. Graphical algebra is performed to obtain the desired transfer relations. The methodology of Driving Point Impedance/Signal Flow Graph (DPI/SFG) is shown to be a systematic, direct approach to analyzing circuits. This methodology is particularly useful in working with feedback circuits where all loading effects are directly and completely included in the analysis.

The seminar will present the methodology and apply it to some interesting problems: simple feedback circuits, finding the impedance of a cascode transistor pair, analyzing the diff amp stage without the use of half cell approximations, and finding the time constants for a clocked latch circuit operating in the linear region.

Date: Monday, 17 May 1999, 10:30 - 11:30

Place: Room 117 EE Building

Info: <http://www.ee.lsu.edu/seminar>