ECE 521 Fall 2010
Analog Circuit Simulation

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Course Objective: Learn the theoretical and practical aspects of building a circuit simulator such as SPICE and be exposed to the current state of the art and the future challenges.

Prerequisites: A background in circuit theory, ability to write software in (C, C++, or Fortran), and an appreciation for numerical methods

Grading:
- Homework (4-5 assignments) 40% (Part 1 - 10%; Part 2 - 30%)
- Exam 30% (M 11/22/10)
- Final Project 30%

Cheating Policy: You may work together on homework but not copy someone else’s work. Cheating is unacceptable.

TextBook: Lecture notes.

References:

Course Outline

(1 week) Formulation of Circuit Equations: Nodal Analysis, Modified Nodal Analysis (MNA), and Sparse Tableau Approach (STA)
(1 week) Solution of linear equations: Direct and iterative methods, Sparse-matrix techniques
(1 week) DC analysis: Solution of nonlinear equations and convergence issues
(3 weeks) Small-signal ac, transient, and Fourier analyses. Anatomy of a circuit simulator
(1 week) Sensitivity and noise analyses
(1 week) Pole/zero analysis and moment matching methods
(2 weeks) Latest advances and analysis methods for RF circuits
9. COURSE ETHICS

Students are expected to uphold high ethical standards including adherence to Oregon State University Academic Regulations and Student Regulations. Also see http://eecs.oregonstate.edu/graduate/cs/dishonesty.html

You are permitted and to a great extent encouraged to seek the advice of others. However, any help/advice you receive must be fully documented so that you do not falsely represent yourself and your work. This course requires that ALL material submitted for grade contain complete documentation including a "References" section appended to the end of each submission. The following table lists some examples of how to properly document your work.

<table>
<thead>
<tr>
<th>Using only the course text book, you complete a homework set.</th>
<th>References: None</th>
</tr>
</thead>
<tbody>
<tr>
<td>You work with a group to complete a homework set.</td>
<td>References: I worked concurrently with Joe Smith, Karen Peavy, and John Shu on this homework set as part of a study group.</td>
</tr>
<tr>
<td>You are stuck on how to draw the free body diagram for one of the problems in a homework set and ask John Smith how he approached the problem.</td>
<td>References: John Smith explained how to set up the free body diagram on problem 1.</td>
</tr>
<tr>
<td>You cannot get your computer program to properly simulate a system and you look at Sally Yam's working computer code.</td>
<td>References: I looked at Sally Yam's properly working computer code to try to figure out what I was doing wrong.</td>
</tr>
</tbody>
</table>

Note that none of the examples listed above would result in a loss of points to the student.
(From The Institute print edition)

The Five Levels Of Plagiarism

1. Uncredited verbatim copying of a full paper. Results in a violation notice in the later article’s bibliographic record and a suspension of the offender’s IEEE publication privileges for up to five years.

2. Uncredited verbatim copying of a large portion (up to half) of a paper. Results in a violation notice in the later article’s bibliographic record and a suspension of publication privileges for up to five years.

3. Uncredited verbatim copying of individual elements such as sentences, paragraphs, or illustrations. May result in a violation notice in the later article’s bibliographic record. In addition, a written apology must be submitted to the original creator to avoid suspension of publication privileges for up to three years.

4. Uncredited improper paraphrasing of pages or paragraphs (by changing a few words or phrases or rearranging the original sentence order). Calls for a written apology to avoid suspension of publication privileges and a possible violation notice in the later article’s bibliographic record.

5. Credited verbatim copying of a major portion of a paper without clear delineation of who did or wrote what. Requires a written apology, and to avoid suspension, the document must be corrected.

The guidelines also make recommendations for dealing with repeated offenses.