CUDA SPICE CIRCUIT SIMULATOR

MILESTONE 3

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PROGRESS SINCE MILESTONE 2:

- DC Sweep Analysis
  - Increment an element parameter over a range of values & save operating point data for each simulated value

- Transient Analysis
  - Increment over timesteps
  - Approximate linear model of capacitances using backwards Euler method
  - Added transistor parasitic capacitances and discrete capacitor modelling

- Transistor model file parsing
  - Potential to create higher level transistor simulation model
  - Can use arbitrary input technology model

- Output to CSV file – a step towards being useful
  - Easy to plot output data in Excel or Matlab

- Slight optimizations – operating point

DEMO

NEXT STEPS:

- Still need to add subcircuit parsing to make this useful for large, complex circuits

- Reduce size of G matrix from N^2 (plan to look into cuSparse)

- Optimize for parallelization, speed improvements
  - Transient sim. dependent on prev. solutions, but:
  - Solver may be optimized to further reduce memory copies,
  - Parallelize matrix population
  - Reduce memory footprint

- Make transistor model more robust:
  - Inclusion of more parameters and effects

- GUI/User interaction improvements