NGSPICE
a GNU standardization perspective
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NGSPICE simulator structure

NGSPICE implemented devices

The big challenges

Source: IEEE Spectrum

Deep sub-micron devices are described by complex nonlinear models consisting of thousands of lines of code (in C).
Modern ICs (SOC, SIP) integrate different functions (logic, analog, memory, MEMS, power management) on the same die or in the same package. The design verification process involves simulation in many different domains (electrical, DSP, transaction).
Space (also space-like simulators) cannot be used to verify such complex design in reasonable time.

Spice and spice-like tools will become part of a hierarchical tool-chain of design verification tools. The role of spice in this tool-chain would be the characterization of subsystems (eventually consisting of millions of devices) with the highest possible detail.

The key issue for spice simulators is the availability of detailed, reliable and widely-accepted device models.

The GNU perspective

- Open standard for compact modeling (that will include the modeling of non CMOS / post-allicon devices).
- Free compact models available in a standard language (with C implementation for SPICE3).
- Standard format for data interchange among different tools.

Happy 40° birthday SPICE!!!