

REVIEW

COMPUTER SCIENCE

There's plenty of room at the Top: What will drive computer performance after Moore's law?

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The miniaturization of semiconductor transistors has driven the growth in computer performance for more than 50 years. As miniaturization approaches its limits, bringing an end to Moore's law, performance gains will need to come from software, algorithms, and hardware. We refer to these technologies as the "Top" of the computing stack to distinguish them from the traditional technologies at the "Bottom": semiconductor physics and silicon-fabrication technology. In the post-Moore era, the Top will provide substantial performance gains, but these gains will be opportunistic, uneven, and sporadic, and they will suffer from the law of diminishing returns. Big system components offer a promising context for tackling the challenges of working at the Top.

- What's your application area?
- Do you do numerical simulation?
- Do you see room for improvement in your simulation? How?
- How much time are you willing to invest on algorithm/implementation?
- Do you think "computational science" is science? Why?
- Do you think "computer science" is science? Why?