Design Without Borders

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Abstract

Electrical engineers have learned how to build amazingly complex systems by assembling transistors, wires, and passive components into intricate networks. While solidly founded in semiconductor physics, pure engineering has made possible the design of multi-billion transistor chips in a repetitive, reliable and cost-effective way. A comprehensive "design methodology" was developed based on modularization, hierarchy and abstraction.

Today this story is repeating itself. Physicists, chemists and biologists are exploring entirely different components such as molecules, atoms, and enzymes. Systems built from those will most probably impact our lives and society in a profound way. Outcomes will influence the ways we build mechanical structures, do computing, make drugs, generate energy and take care of our environment.

Yet, while the basic components are dramatically different from our silicon devices, the basic strategy for building very complex systems from them remains unchanged. The art of design, as was developed in the silicon era, is just as applicable to these nano- or bio-constructions. Design methodology is a legacy that will live long after Moore's law has come to a halt. To quote the late Richard Newton, "The Future is BDA (Bio Design Automation)".

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