

Bits and Atoms

Neil Gershenfeld, MIT, Cambridge, Massachusetts, USA

Abstract

We've had digital revolutions in communications and computation, but not yet fabrication. Computers control machines that make computers, but a 10-billion-dollar chip fab still uses fundamentally analog materials. Biology provides an alternative model based on programmed assembly of molecular building blocks, offering the same kind of reliability thresholds that enable digital communications and computation. I will present research on fundamentally digital fabrication technologies that merge computation with construction, and illustrate their implications in both developed and developing countries through early access to prototype tools for personal fabrication.

Author Biography

Prof. Neil Gershenfeld is the Director of MIT's Center for Bits and Atoms. His unique laboratory investigates the relationship between

the content of information and its physical representation, from molecular quantum computers to virtuosic musical instruments. Technology from his lab has been seen and used in settings including New York's Museum of Modern Art and rural Indian villages, the White House/Smithsonian Millennium celebration and automobile safety systems, the World Economic Forum and inner-city community centers, Las Vegas shows and Sami reindeer herds. He is the author of numerous technical publications, patents, and books including "Fab," "When Things Start To Think," "The Nature of Mathematical Modeling," and "The Physics of Information Technology," and has been featured in media such as The New York Times, The Economist, CNN, and the McNeil/Lehrer News Hour. Dr. Gershenfeld has a BA in Physics with High Honors from Swarthmore College, a Ph.D. from Cornell University, was a Junior Fellow of the Harvard University Society of Fellows, and a member of the research staff at Bell Labs.