



Programming Bits and Atoms

Neil Gershenfeld
MIT Center for Bits and Atoms

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Software is digital, but not physical: it is represented by bits of information that are written without physical units. Hardware is physical, but not digital: it can contain information, but its own construction is continuous. I will present research on aligning the descriptions of software and hardware, and explore its implications for the future of computation and fabrication.



Prof. Neil Gershenfeld is the Director of MIT's Center for Bits and Atoms. His unique laboratory is breaking down boundaries between the digital and physical worlds, from creating 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 and the World Economic Forum, inner-city community centers and automobile safety systems, Las Vegas shows and Sami 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*, NPR, CNN, and PBS. He is a Fellow of the American Physical Society, has been named one of *Scientific American's* 50 leaders in science and technology, as one of 40 *Modern-Day Leonardos* by the Museum of Science and Industry, one of *Popular Mechanic's* 25 Makers, has been selected as a CNN/Time/Fortune Principal Voice, and by *Prospect/Foreign Policy* as one of the top 100 public intellectuals. Dr. Gershenfeld has a BA in Physics with High Honors from Swarthmore College, a Ph.D. in Applied Physics from Cornell University, honorary doctorates from Swarthmore College and Strathclyde University, was a Junior Fellow of the Harvard University Society of Fellows, and a member of the research staff at Bell Labs.