



MSEN 681 Seminar Series

4:10 PM, Monday, November 24, 2014 • 104 Jack E. Brown

Microelectronics and Nanoelectronics: Past, Present, and Future

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abstract

Since the invention of the transistor, the tremendous progress in the electronics industry has been riding on the exponential growth of the IC technology, as characterized by the “Moore’s Law”, which basically says that the information storage capacity of a silicon chip, as well as its information processing power, grows exponentially with time. Since the cost of a silicon chip has remained more or less constant over the years, an average consumer now possesses more computing power than a supercomputer did in the early 80’s that cost a few million dollars then. The internet, smart phones, and various intelligent appliances that so many of us take for granted today are all made possible because of the ever more powerful IC’s.

Surpassing the automobile industry in terms of annual sales worldwide more than a decade ago, the electronics industry is the largest industry of its kind in USA and most other industrialized countries. Because of its critical importance to a country’s economic development and national defense capability, the information technology, rooted in electronics, will undoubtedly receive even more attention from all nations,

What makes the silicon chip tick? Why is the electronics industry growing so fast? This talk will give an overview of the silicon chip technology and its applications, with a preview of what’s to come in the future. The various difficulties encountered in continued scaling of CMOS devices will be reviewed, and possible solutions will be discussed.

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