An Introduction to the Semiconductor Industry

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Abstract

Over more than 5 decades, semiconductors adoption has been so pervasive to becoming a basic need for the humanity. In an ever-growing industrial society, air, water, food, healthcare, education, energy, and sustainability have all becoming reliant on availability of integrated circuits (a.k.a. chips). Hence, now more than ever, it is important to lower the barriers and provide ease of access to everyone, in terms of use (of goods), manufacturing and design.

The semiconductor industry is a continuously evolving fast-paced field and probably the most complex ecosystem in the world. It is currently supported on deep specialization within many geographical regions and corporate areas, and it also requires a huge variety of raw materials (elements), sourced from all around the world. Moreover, it's a field that involves multiple engineering disciplines, from electrical, chemical, mechanical to software & AI and a very wide range of sciences, including chemistry, quantum and statistical mechanics, statistics, economics, logistics, and even seismology!

This introduction, based on more that 25 years of experience in the field, is presented from an engineering point of view. The aim is to provide some light on the complexity of this ecosystem and build a good sense of the scales and the order of magnitudes involved. For the EE audience in particular, the goal is also to paint a picture of possibilities for the future to come and how these aspects can influence their future designs and research.

Outline of the course

The material will be presented in 3 parts of 2 hours each and it will include the following topics:

- The Semiconductor Ecosystem
- The Semiconductor Market
- Moore's Law and Scaling
- Scaling and Cost Factors
- Transistors Advancements and UTB Devices
- Semiconductor Industry History
- Semiconductor Shortage Crisis
- Democratization of Silicon

Lessons date and time

- Friday Mar. 25, 9-11am, Room 4.1
- Friday Apr. 1, 9-11am, Room 4.1
- Friday Apr. 8, 9-11am, Room 4.1

Virtual room

- Fai clic qui per partecipare alla riunione