The unimaginable power of Transistors /Memristors

BY

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The incredible journey of transistors

The numbers:

1966 – 30 transistors in a single chip

1972 –Intel's first chip had 2000 transistors

Today- chips have 40 million transistors- feature sizes ranging from 130-180 nanometers

Intel's recent announcement-transistors just 90 nanometers wide!

Cost :

1968- one transistor cost $1

Now- 50 million transistors cost $1

What it means! The incredible facts!

- **100,000 transistors now cost less than a grain of rice**
- A lap top has 37 billion transistors
- Ipod has 256 billion transistors
- Black berry has a billion
- Kindle has 16 billion
- S550 Mercedez Benz car has 5-10 billion transistors
- Each of us has hundreds of billions of transistors if you count all gizmos!
- World produced 10 quintillion transistors in 2009
- That is 250 times more than all grains of rice consumed in 2009
- **Probably nothing in the world has grown like transistors!**

Moore's law still works!

- "Computer processing power, or the number of transistors on an integrated chip, would double every 18 months"
  - Gordon Moore made this prediction in 1965
- What this means:
  - Faster computing and greater data storage at continuously lowering cost year after year!
- Till now this has happened!

The most intelligent machine ever

- The TV Game show 'Jeopardy' is supposed to be one of the toughest in the world -this demands a large store of trivia and requires split second decisions.

- In Dec in a mock version of the game **IBM's Watson** answered a query before the other contestants could answer! It was not even connected to Internet!

- **Watson is the world's most advanced 'question answering machine' able to understand a question posed in every day human elocution and respond with a precise factual answer.**

- No University or software firm has ever tackled 'Jeopardy' before.

- The medical version of Watson would probably be able to take split second decisions in an emergency room crisis.

- IBM wants to create the Watsons for retail, transportation and banking industries!

- Every day life may be changed by future Watsons!

How many transistors does a Watson have?

- Watson is so complex, vast and ever changing that even IBM does not know how many transistors it has!

The frightening possibilities

- US Navy's study of 'autonomous military robotics' says:
  - There is a possibility that we may not be able to halt some (potentially fatal) chain of events caused by systems that process information and can act at speeds incomprehensible to us.
- Be ready!

And the positive side

- An alternative to transistor called '**memristor**' has been just invented!
- HP scientists said recently they have begun commercialising this Lilliputian switch which will be smaller and simpler than the transistor
- So Moore's Law may continue to be fulfilled for many more years!
- A future chip may contain as much data as an entire disk drive holds today!
- We may be seeing much bigger and greater achievements in computing!
- One possible project : Central Nervous system for the Earth.
    - This will make it possible to have a clearer picture of Oil and Gas reserves in the world!

Sources

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