IEEE Brainwaves

IEEE Brainwaves Newsletter is published by the IEEE Brainwaves student chapter of D.J. Sanghvi College of Engineering

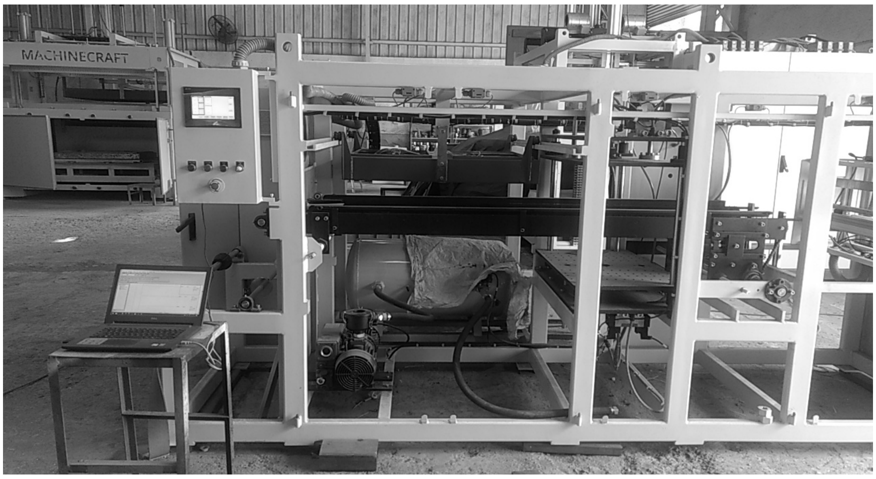
IEEE Brainwaves Feature Events :

Industry Visit to Machinecraft

The purpose of the visit was to enhance industry exposure of the students and to get practical insights into manufacturing procedures. The committee visited the company to interact with the machine Industry and to understand current market scenarios, latest demanding technologies & criteria for selection etc.

Machinecraft has continually innovated and introduced forming machinery in India and have participated in global fairs like the K fair, Plastindia and Plastivision.

The company's manufacturing is basically divided into manufacturing of the thick sheet and the thin sheet plastic producing machineries. Students were given tour of the factory by Mr. Rushabh Doshi. A brief introduction about the machine classifications and the overall machine processing units was delivered. Various pneumatic and hydraulic components were well explained to which the students were able to experience the real working of such systems that they had studied in the instrumentation subjects.



Thermoforming is a manufacturing process where a plastic sheet is heated to a pliable forming temperature, formed to a specific shape in a mould, and trimmed to create a usable product. The sheet, or "film" when referring to thinner gauges and certain material types, is heated in an oven to a high-enough temperature that permits it to be stretched into or onto a mould and cooled to a finished shape. Its simplified version is vacuum forming. This moulding process was well demonstrated and explained to the students. Thermoforming is usually used to make large parts that have small batch size instead of Injection Moulding.

The company also has its own CNC machine. The students were shown a basic demo as on how the machine works. CNC are a contrast to machines that are manually controlled by hand wheels or levers, or mechanically automated by cams alone. The company produces their solid mechanical parts and components in the CNCs which are pre-loaded with a program.

The students got benefited in terms of the technical details provided by the organization on the modern manufacturing machineries and self-automation.

IEEE Spectrum Article :

The Future of Computing Depends on Making It Reversible

It's time to embrace reversible computing, which could offer dramatic improvements in energy efficiency

For more than 50 years, computers have made steady and dramatic improvements, all thanks to Moore's Law—the exponential increase over time in the number of transistors that can be fabricated on an integrated circuit of a given size. Moore's Law owed its success to the fact that as transistors were made smaller, they became simultaneously cheaper, faster, and more energy efficient. The -payoff from this win-win-win scenario enabled reinvestment in semiconductor fabrication technology that could make even smaller, more densely packed transistors. And so this virtuous -circle continued, decade after decade.

Now though, experts in industry, academia, and government laboratories anticipate that semiconductor miniaturization won't continue much longer—maybe 5 or 10 years. Making transistors smaller no longer yields the improvements it used to. The physical characteristics of small transistors caused clock speeds to stagnate more than a decade ago, which drove the industry to start building chips with multiple cores. But even multicore architectures must contend with increasing amounts of "dark silicon," areas of the chip that must be powered off to avoid overheating.

Heroic efforts are being made within the semiconductor industry to try to keep miniaturization going. But no amount of investment can change the laws of physics. At some point—now not very far away—a new computer that simply has smaller transistors will no longer be any cheaper, faster, or more energy efficient than its predecessors. At that point, the progress of conventional semiconductor technology will stop.

What about unconventional semiconductor technology, such as carbon-nanotube transistors, tunneling transistors, or spintronic devices? Unfortunately, many of the same fundamental physical barriers that prevent today's complementary metal-oxide-semiconductor (CMOS) technology from advancing very much further will still apply, in a modified form, to those devices. We might be able to eke out a few more years of progress, but if we want to keep moving forward decades down the line, new devices are not enough: We'll also have to rethink our most fundamental notions of computation.

Let me explain. For the entire history of computing, our calculating machines have operated in a way that causes the intentional loss of some information (it's destructively overwritten) in the process of performing computations. But for several decades now, we have known that it's possible in principle to carry out any desired computation without losing information—that is, in such a way that the computation could always be reversed to recover its earlier state. This idea of reversible computing goes to the very heart of thermodynamics and information theory, and indeed it is the only possible way within the laws of physics that we might be able to keep improving the cost and energy efficiency of general-purpose computing far into the future.

In the past, reversible computing never received much attention. That's because it's very hard to implement, and there was little reason to pursue this great challenge so long as conventional technology kept advancing. But with the end now in sight, it's time for the world's best physics and engineering minds to commence an all-out effort to bring reversible computing to practical fruition.

Continue Reading at

https://spectrum.ieee.org/computing/hardware/the-future-of-computing-depends-on-making-it-reversible