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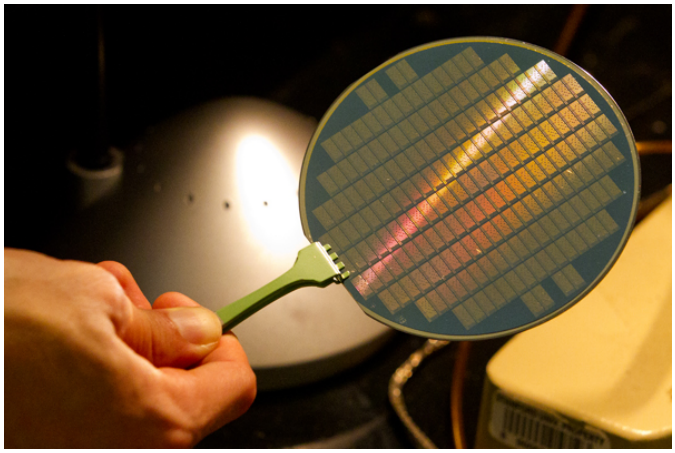
The fantastically named "carbon nanotubes" (CNT) might look like just another supposed silicon killer (such as graphene and its ilk), but Stanford University researchers manage to create a first-- a basic computer using the semiconductor material.



First described in a Nature paper, the CNT computer consists of 178 logic gates, can count up to 32 and performs counting and number sorting tasks. It runs code written in MIPS, fetching instruction from memory before execution at a clock rate of 1KHz.

In other words, it is a very basic machine but for one difference-- the logic gates are of the experimental 9-nanometer CNT variety, and make the latest 22nm gates look positively gigantic. It also proves the technology has actual potential to becoming a replacement to silicon.

"People have been talking about a new era of CNT electronics moving beyond silicon," researcher Subhasish Mitra says. "But there have been few demonstrations of complete digital systems using this exciting technology. Here is the proof."

But what are carbon nanotubes, beyond sounding like something out of Buck Rogers? CNTs are tiny (1000s can fit side by side in a human hair) tube-shaped chains of carbon atoms. Being very efficient electric conductors and controllers, CNTs should make excellent transistors-- but only if one can "grow" them in neat parallel lines. The researchers manage to do that most of

the times (with a success rate of 99.5%, to be precise), while a powerful algorithm ensures remaining non-straight CNTs do not affect circuit layouts.

Of course, the Stanford CNT design is still in its early days, but as researcher Supratik Guha says "these are initial necessary steps in taking carbon nanotubes from the chemistry lab to a real environment." So who knows, maybe silicon's days are numbered after all.

Go Carbon Nanotube Computer (Nature)

Go A First: Stanford Engineers Build Basic Computer Using Carbon Nanotubes