There's Plenty of Room at the Bottom by Richard Feynman

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Abstract

In this text, that is based on the transcript of the talk: "There's Plenty of Room at the Bottom" by Richard p. Feynman in Caltech in the year of 1959, two ideas are extracted arbitrarily and discussed, according to the interest of the author.

1   Idea 1

There was plenty of room at the bottom, until there was not any more
By the times this text written to now, computers have gotten better in terms of computing power, this is in good part thanks to the miniaturisation of the transistors, that is the building block of digital computers.

The miniaturisation of the transistor is no longer a blue sky, because we have made them so small that quantum tunnelling effects happen within them, making us unable to control the flow of electrons in the terminals of the transistor. This phenomenon may slow down or completely stagnate the level of computing power available to humankind. My own prediction is that the computing power provided by digital computers we have available will not grow exponentially anymore, but it will only grow linearly, as some minor improvements are made to microprocessors and the number of computing devices grow, but this growth will halt at some point because the amount of energy that it may demand will be just too big.

A good idea worth exploring, is to build specific purpose architectures. For instance, when doing a finite element analysis of a mechanical element; the solver basically computes a ton of matrix multiplications. What if we built a processor with a built in, specific purpose arithmetical logical unit, that had an input two nxnx3 matrices and gave as an output the multiplication of those matrices? Under this computational platform, many difficult problems could become easy.

I can imagine some other examples where creating specific purpose architectures may be beneficial, but right now, I want to get on the quantum computing train and help to see how far can we go there.

2   Idea 2

Going forward, but... Where are we going?
Feynman loves to make this technological sketches, where he just imagines things happening just for fun. What a wonderful world it would be if scientists could research things just for fun! Sadly, we can not. Researching whatever we want, and innovating without having a clear path, or at least an idea of where do we want to go, mitigates the effects of the scientific community over the society.

Some efforts have been made towards an international unified front to face a certain problem such as the "Materials Acceleration Platform", that is a joint venture of the Mexican Secretariat of Energy, the US department of energy, and the Canadian Institute for Advanced Research that encourages the discovery of new materials using artificial intelligence.

I believe that the best way for scientists to have a more significative influence in society is to participate in the knowledge transfer process to innovate or create new technologies, but also we need to find a way to get this efforts tackle meaningful problems