Revision of Curriculum Recommendations urgently needed

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The energy consumption of future server farms, all other ICT infrastructures and supercomputers is heading toward astronomic dimensions and may become unaffordable towards the end of next century or even earlier. The sizes of the world-wide 8.6 million huge data centers are growing massively. We will be witnessing the mainframe age spirit collapsing under the von Neumann syndrome.

We are forced to go twin-paradigm by disestablishing the monopoly-like dominance of the (instruction-stream-based) von-Neumann-paradigm (vN) - by including the data-stream-based (Xputer[1]) paradigm of "Reconfigurable Computing" using accelerators like FPGAs (Field-Programmable Gate Arrays) which came to market in 1984. (This kind of parallelism is much more easy to understand than manycore.) By vN to FPGA conversion speed-up factors between 10 and 30,000 and energy saving factors between 0.3 and 0.0002 have been obtained - depending on the application and on the skills of the conversion implementers.(First time to space mapping methods have been published already in the 70ies.)

Why is marketing such highly attractive FPGAs not very successful? **This is an education problem:** the lacking qualification of people doing the synthesis job or implementing the application development systems. **It's a curriculum issue !**

To create widely spread twin-paradigm qualifications we must completely redefine our entire discipline by massive new R&D efforts and **revolutionary curricula innovations - to avoid computing-based infrastructures becoming unaffordable.** Also much better methods for compilation from programming languages down to FPGAs or twin-paradigm systems are urgently needed.

Within the 2013 ACM and IEEE Computer Egineering Curricula (519 pages) **the word "reconfigurable" does not exist** and the keyword **"FPGA" does not at all appear** within the official part. (only once inside a discussion section). In these recommendations the consequences of the von Neumann syndrome are **strictly under taboo**. So the massive lack of qualified people is no surprize.

For a more detailed introduction see:

http://www.fpl.uni-kl.de/staff/hartenstein/Energy-efficient_computing_paradigm.pdf

[1]) having several data counters instead of a program counter