

# The von Neumann Syndrome and the CS Education Dilemma

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**Abstract.** Computing the von Neumann style is tremendously inefficient because multiple layers of massive overhead phenomena often lead to code sizes of astronomic dimensions, thus requiring large capacity slow off-chip memory. The dominance of von-Neumann-based computing will become unaffordable during next decade because of growing very high energy consumption and increasing cost of energy.

For most application domains a von-Neumann-based parallelization does not scale well, resulting in the escalating many-core programming crisis by requiring complete re-mapping and re-implementation - often promising only disappointing results. A sufficiently large population of many-core-qualified programers is far from being available. Efficient solutions for the many-core crisis are hardly possible by fully instruction-stream-based approaches. Several HPC celebrities call for a radical re-design of the entire computing discipline. The solution is a dual paradigm approach, which includes fundamental concepts known already for a long time from Reconfigurable Computing. Whistle blowing is overdue, since these essential qualifications for our many-core future and for low energy computing are obstinately ignored by CE, CS, EE, and IT curriculum task forces. This talk sketches a road map.

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\*) keynote address, The 4<sup>th</sup> International Workshop on Applied Reconfigurable Computing (ARC), March 26-30, 2008, London, UK

[http://cas.ee.ic.ac.uk/people/ccb98/arc2008/invited\\_speakers.html](http://cas.ee.ic.ac.uk/people/ccb98/arc2008/invited_speakers.html)