Number Representations and Their Applications to Hardware Devices

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Abstract

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As Moore's Law falters, scientists are seeking out novel devices to optimize the performance, energy usage, and space of computation. However, the physics behind these devices may not be intrinsically suited to the same binary data representations as traditional transistor-based hardware. We investigate various number representations and map them to developing technologies in order to optimize future projects, illustrating that it may be critical to look beyond the standard 2's complement binary infrastructure when pursuing new computer architectures.

Keywords: *number representations, developing hardware, Moore's Law*