Speed-up Factors

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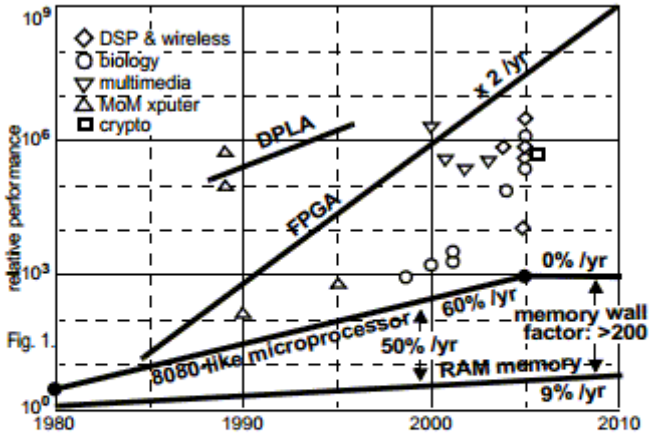

Fig. 1

Compared to software implementations sensational speed-up factors have been reported for software to configware migrations by using FPGAs. Fig. 1 shows a few speedup factors picked up from literature, reporting a factor of 7.6 in accelerating radiosity calculations [1], a factor of 10 for FFT (fast Fourier transform), a speedup factor of 35 in traffic simulations [2]. For a commercially available Lanman/NTLM Key Recovery Server [3] a speedup of 50 - 70 is reported. Another cryptology application reports a factor of 1305 [5]. A speedup by a factor of 304 is reported for a R/T spectrum analyzer [7]. In the DSP area [8] for MAC [8] operations a speedup factor of 100 has been reported compared to the fastest DSP on the market (2004) [9]. Already in 1997 versus the fastest DSP a speedup between 7 and 46 has been obtained [10]. In Biology and genetics (also see [11] [11]) a speedup of up to 30 has been shown in protein identification [13], by 133 [14] and up to 500 [15] in genome analysis, as well as 288 with the Smith-Waterman pattern matching algorithm at the National Cancer Institute [17]. In the multimedia area we find factors ranging from 60 to 90 in video rate stereo vision [18] and from 60 to 90 in real-time face detection [19], and of 457 for hyperspectral image compression [20]. In communication technology we find a speedup by 750 for UAV radar electronics [21]. These are just a few examples from a wide range of publications [23] [24] [26] [27] [28] [30] [32] reporting substantial speedups by FPGAs.

For an **updated version picture**[33] see: http://www.fpl.uni-kl.de/staff/hartenstein/Fig-15-speed-up.pdf

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[8] ***ASM*** = Auto-Sequencing Memory; ***DSP*** = Digital Signal Processing; ***EDA*** = Electronics Design Automation; ***ESL*** = Electronic System-Level Design; ***FIR*** = Finite Impulse Response; ***FPGA*** = Field-Programmable Gate-Array; ***MAC*** = Muliply and Accumulate; ***PU*** = Processing Unit ***rDPA*** = reconfigurable Data Path Array; ***rDPU*** = reconfigurable Data PathUnit; ***rE*** = reconfigurable Element

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