EFFICIENT MATRIX MULTIPLICATION USING HARDWARE INTRINSICS AND PARALLELISM WITH C#

Nikolay Pavlov

Abstract. In this paper we improve the efficiency of the simple matrix-multiplication algorithm using parallelism and hardware instrinsics with C# and .Net Task Parallel Library. We demonstrate how additional processing can result the overall shorter execution times. We present an algorithm in C# that achieves up to five times performance improvement on midrange hardware, using single-instruction-multiple-data instructions and unsafe code foo direct access to memory where other techniques are not possible in the .Net managed environment.

Key words: matrix multiplication, hardware instrinsics, parallelism, simd, multi-threading, .net.

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Nikolay Pavlov[1,*]
[1] Paisii Hilendarski University of Plovdiv,
Faculty of Mathematics and Informatics,
236 Bulgaria Blvd., 4003 Plovdiv, Bulgaria
[*] Corresponding author: nikolayp@uni-plovdiv.bg