

Title: Systematic Evaluation of a Vectorized Interpolation Kernel

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Synopsis

Modern CPUs incorporate "vector" features which enable the simultaneous identical computations upon multiple input values. In order to effectively utilize these features, a program must implement an algorithm in a form amenable to vectorization.

This presentation describes strategies we used to validate and evaluate the performance of a interpolation function that was manually converted to a form that simultaneously performs multiple interpolation computations. The multiple operands to and results from the vectorized version of this function are packed into vectors. The effective speedup provided by the transformed function is limited by hardware characteristics, the computation required to convert input and output data to and from vector formats, and vector length.

Systematic strategies were employed that may be suitable for evaluating other vectorized computations. Our presentation will describe these strategies and analyze the results they yielded including a characterization of realistic scenarios where the original serial and vectorized implementations provide superior performance.