SIMTasks: Task Parallelism goes SSE

FTL Engine: Algorithms for a Fast Tree Library

Case Study: C3 HTML5 Platform’s Layout Engine

C# sequential
coldpath

C++ SSE
“SIMTask” hotpath

Simultaneous Optimizations

BASICS:
• inlining
• float -> int
• linear traversal
• simplified dispatch

Blocking + Pointer Compression

Semi-Static Work Stealing

Off-the-shelf task parallelism fails
Solution: Semi-static work stealing
• Precompute schedule
• Use tuned locking for fast synchronization
• Use work-stealing simulation for load balancing
• Additional benefit: locality across traversals