

Parallel Vector Processing Using Multi Level Orbital DATA

Authors : Nagi Mekhiel

Abstract : Many applications use vector operations by applying single instruction to multiple data that map to different locations in conventional memory. Transferring data from memory is limited by access latency and bandwidth affecting the performance gain of vector processing. We present a memory system that makes all of its content available to processors in time so that processors need not to access the memory, we force each location to be available to all processors at a specific time. The data move in different orbits to become available to other processors in higher orbits at different time. We use this memory to apply parallel vector operations to data streams at first orbit level. Data processed in the first level move to upper orbit one data element at a time, allowing a processor in that orbit to apply another vector operation to deal with serial code limitations inherited in all parallel applications and interleaved it with lower level vector operations.

Keywords : Memory Organization, Parallel Processors, Serial Code, Vector Processing

Conference Title : ICPP 2017 : International Conference on Parallel Processing

Conference Location : Rome, Italy

Conference Dates : March 05-06, 2017