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(71) Applicants and
(72) Inventors: **BHANOT, Gyan, V.** [US/US]; 347 Dodds Lane, Princeton, NJ 08540 (US). **CHEN, Dong** [CN/US]; 15 Scenic Drive, Apt. K, Croton-On-Hudson, NY 10520 (US). **GARA, Alan, G.** [US/US]; 38 marion Ave., Mount Kisco, NY 10549 (US). **GIAMPAPA, Mark, E.** [US/US]; 140 North Broadway, Apt. GT-14, Irvington, NA 10533 (US). **HEIDELBERGER, Philip** [US/US]; 24 Lakeview Avenue West, Cortlandt Manor, NY 10567 (US). **STEINMACHER-BUROW, Burkhard, D.** [CA/US]; 28 Manchester Drive, MOunt Kisco, NY 10549 (US). **VRANAS, Pavlos, M.** [GR/US]; 30-A Bedford Avenue, Bedford Hills, NY 10507 (US).

(74) Agents: **GROLZ, Edward, W.** et al.; Scully, Scott, Murphy & Presser, 400 Garden City Plaza, Garden City, NY 11530 (US).

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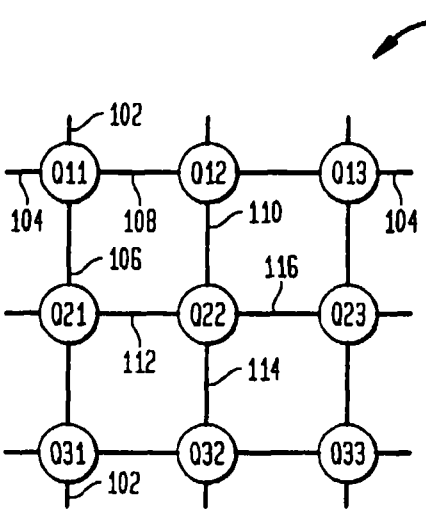
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(54) Title: EFFICIENT IMPLEMENTATION OF A MULTIDIMENSIONAL FAST FOURIER TRANSFORM ON A DISTRIBUTED-MEMORY PARALLEL MULTI-NODE COMPUTER



parallel supercomputer.

(57) Abstract: The present invention is directed to a method, system and program storage device for efficiently implementing a multidimensional Fast Fourier Transform (FFT) of a multidimensional array comprising a plurality of elements initially distributed in a multi-node computer system(100) comprising a plurality of nodes(Q11-Q33) in communication over a network, comprising distributing the plurali ty of elements of the array in a first dimension across the plurality of nodes of the computer system over the network to facilitate a first one-dimensional FFT; performing the first one-dimensional FFT on the elements of the array distributed at each node in the first dimension; re-distributing the one-dimensional FFT-transformed elements at each node in a second dimension via "all-to-all" distribution in random order across other nodes of the computer system over the network; and performing a second one-dimensional FFT on elements of the array re-distributed at each node in the second dimension, wherein the random order facilitated efficient utilization of the network thereby efficiently implementing the multidimensional FFT. The "all-to-all" re-distribution of the array elements is further efficiently implemented in applications other that the multidimensional FFT on the distributed-memory

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