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13. ABSTRACT (Maximum 200 words)

Research efforts have centered in the areas of parallel and distributed computing, network architecture, combinatorial algorithms, and complexity theory. Significant progress has been made on the development of efficient sorting circuits, network management protocols for high speed nertworks, distributed graph algorithms and data structured, improved algorithms for packet routing and sorting in parallel machines, algorithms for reconfiguring networks around faults, improved approximation algorithms for a variety of NP-hard optimization problems, VLSI design, and algorithms for combinatorial problems such as multicommodity flow.

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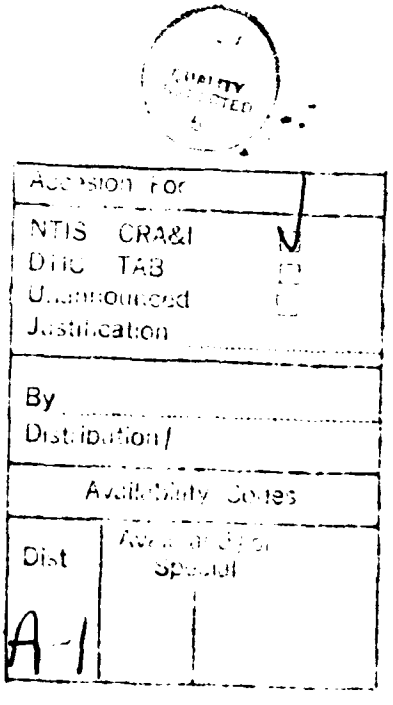

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Summary

Our research efforts have centered in the areas of parallel and distributed computing, network architecture, combinatorial algorithms, and complexity theory. Significant progress has been made on the development of efficient sorting circuits, network management protocols for high speed networks, distributed graph algorithms and data structures, improved algorithms for packet routing and sorting in parallel machines, algorithms for reconfiguring networks around faults, improved approximation algorithms for a variety of NP-hard optimization problems, VLSI design, and algorithms for combinatorial problems such as multicommodity flow.

Particular highlights include:

- the work of Leighton and Maggs on the computational power and fault-tolerance of randomly-wired networks,
- the discovery of the first optimal algorithms for routing on a nonblocking network by Arora, Leighton, and Maggs,
- the work of Leighton and Plaxton on the construction of a simple $c \log N$-depth circuit (where $c < 7.5$) that sorts a random permutation with very high probability,
- the work of Leighton, Tardos, et.al. on the discovery of dramatically faster approximation algorithms for multicommodity flow problems, and
- the work of Awerbuch et al. on the development of a wide array of protocols for distributed networks.

Copies of papers describing these highlights are enclosed with the report.

We have enclosed a complete list of publications and theses supported by the contract with this report. Copies of the papers and/or detailed information about the results they contain will be furnished upon request.

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Patents

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