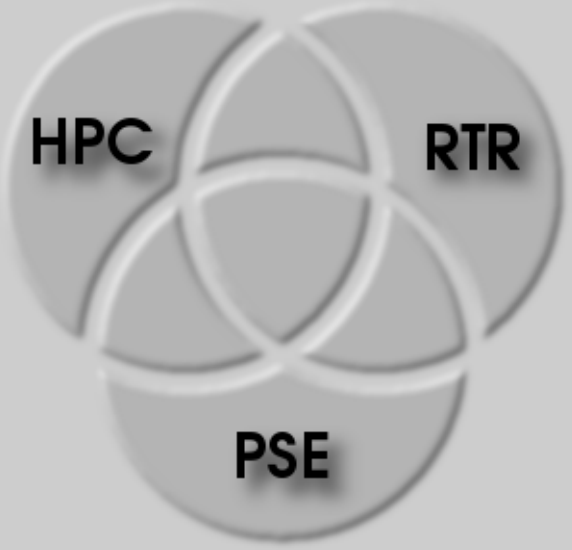
RESEARCH SUMMARY & GOALS

Ron Sass



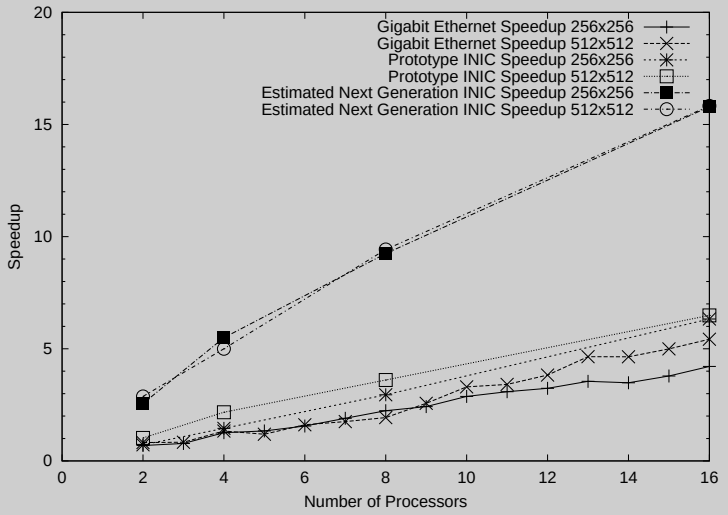
Prior/Active Sponsored Research Projects

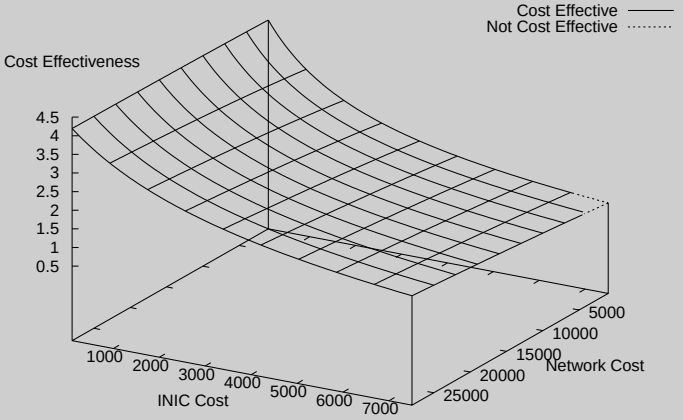
- Reconfigurable Computing Cluster (NSF, $167) [PI]
- Automatic Synthesis of Hardware Features (IBM, $20K) [PI]
- Dynamic Hardware Reconfiguration to Accelerate Java-Based Embedded Systems (NSF, $240K) [PI]
- Alternative Computing Roadmap (NASA, $153K) [PI]
- Adaptable Computing Cluster (NSF, $168K) [PI]
- An Operational Parallel File System for Beowulf (NASA, $212K) [Co-PI]
- An Application Development Framework for Reconfigurable Computing (NASA, $300K) [Co-PI]

Adaptable Computing Cluster

- basic idea: put user-programmable FPGA in the network interface of a commodity (Beowulf-class) cluster
- contribution: showed that simple operations on data *as it travels through the network* can have much larger effect on performance of the system

Adaptable Computing Cluster (cont'd)

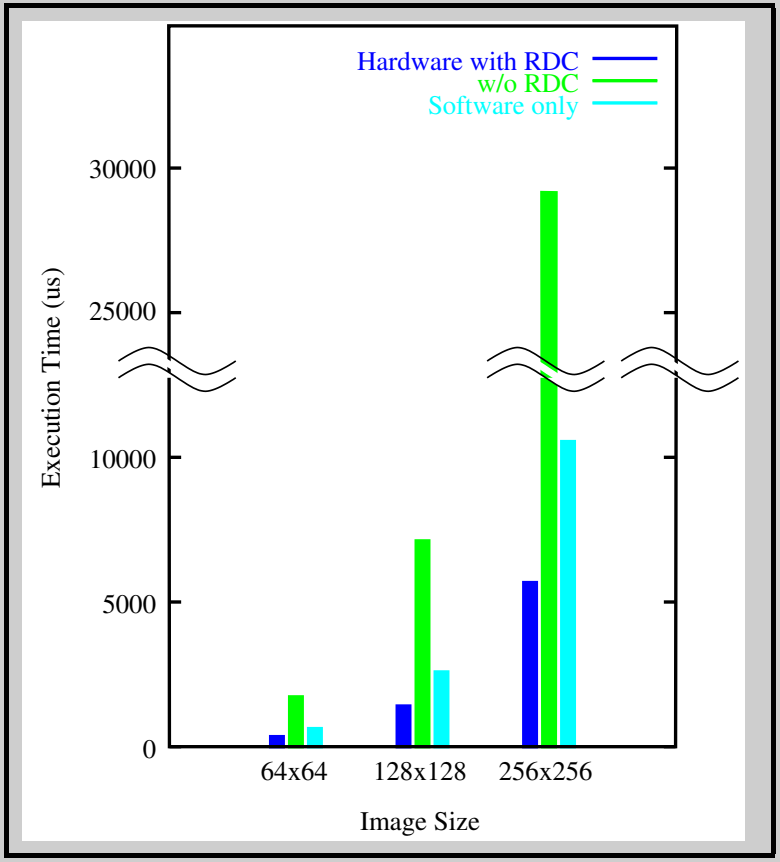




Reconfigurable Data Cache

- basic idea: use data dependence information from compiler to build application-specific cache
- contribution: an algorithm to determine and synthesize design of maximum performance based on resources and bandwidth

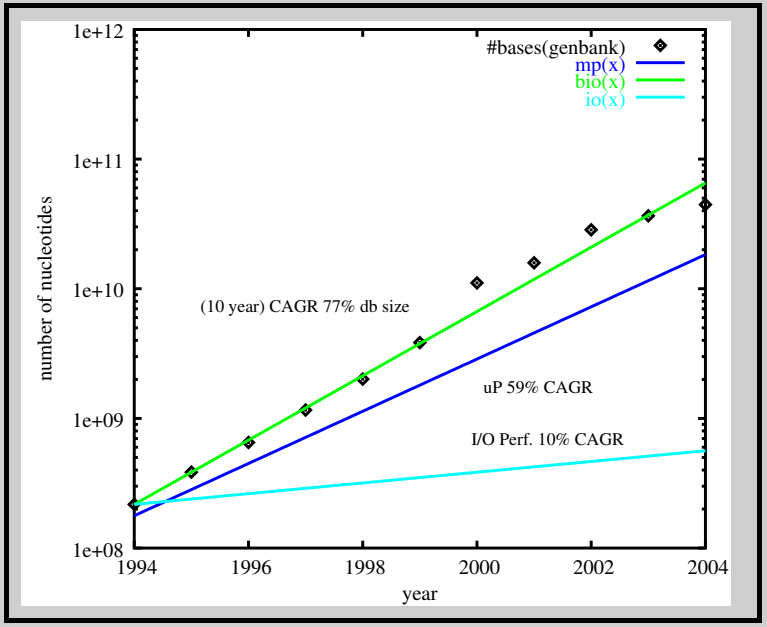
Reconfigurable Data Cache (cont'd)

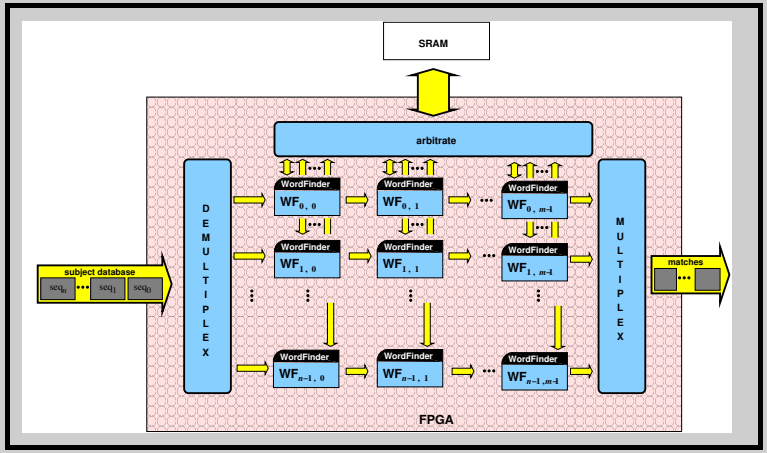


RC-BLAST

- basic idea: map compute-intensive part of BLAST app to FPGA
- contribution: show that it is more cost-effective to use FPGAs than simply buying cluster of PCs

RC-BLAST (cont'd)

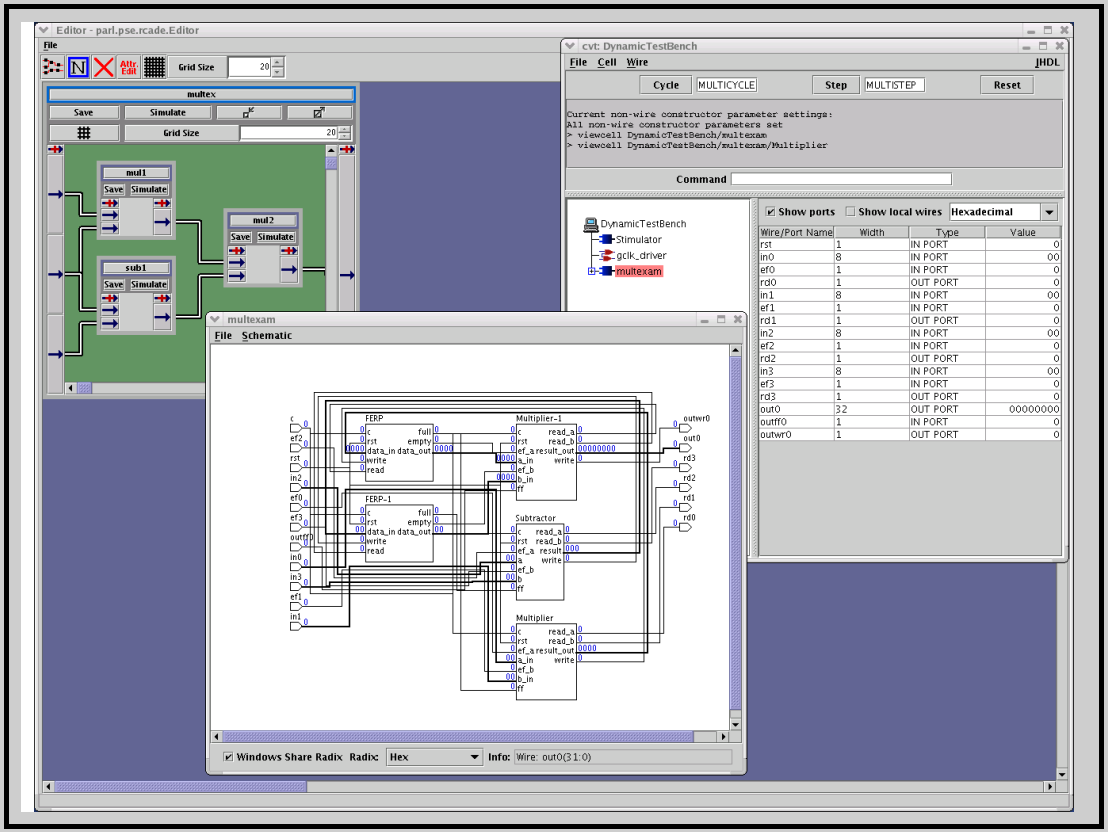




RCADE

- basic idea: problem-solving environment to make RC accessible to computational scientists
- contribution: a framework for building problem-solving environments

RCADE (cont'd)



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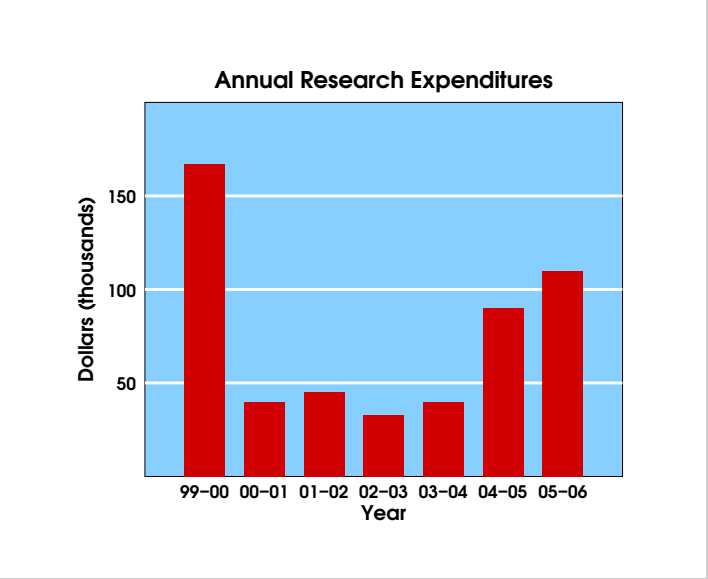
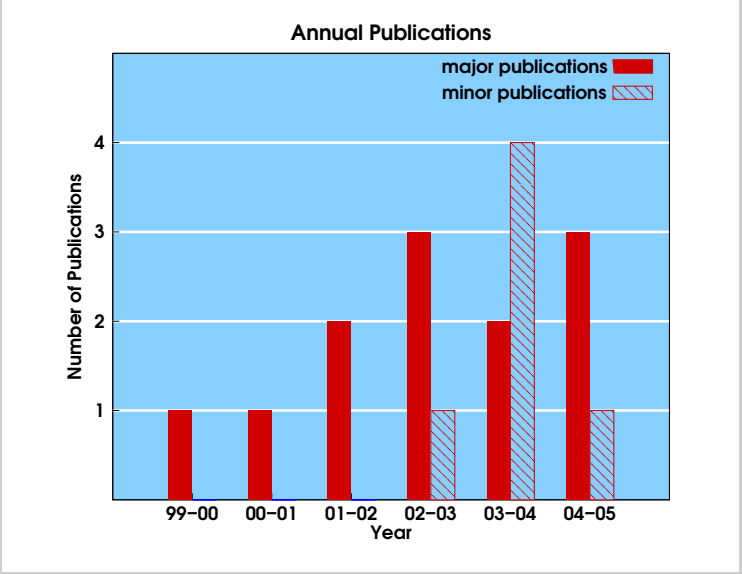
Near-Term Goals





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