Applications (NGI Goal 3)



PITAC NGI Review

NSF Presentation

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6 October 1999

Overview

Applications activity within the 100X community

- Projects specifically funded by CISE
- High Performance Network Applications Team (HPNAT)
- New ANI program directions vis-à-vis applications

Applications in the 100X Domain

Examples:

- Illinois-Chicago (Grossman): data mining
- Oklahoma (Droegemeier): weather research
- North Carolina (Smith, Jeffay): nano-manipulators
- UC San Diego (Ellisman): international microscopy

Messages:

- This initiative is about more than bandwidth
- Researchers are attempting things on this network that they might not have attempted on the Internet

University of Illinois at

Chicago (www.ncdm.uiuc.edu)

💥 The National Center f	or Data Mining - Netsca	ipe				
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M3D2 Report - Data Mining: Challenges and						
Opportunities						
Software & Other Resources						
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Mathematical and Information Sciences for Industry						
Program (An MSCS Masters Degree program)						
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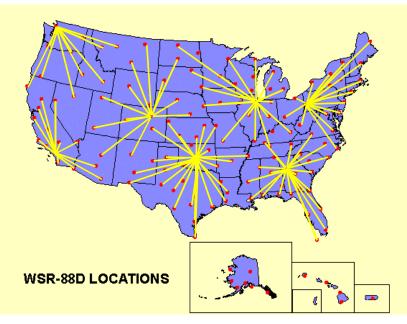
Goal: extract information from massive, distributed, disparate sources

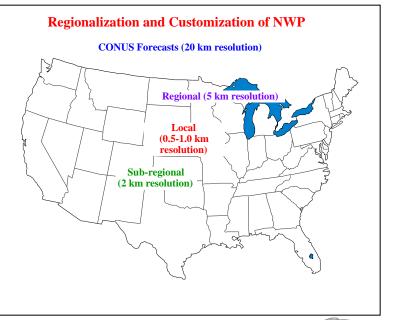
- DSTP: Data Space Transfer Protocol
- Most Innovative of Show" at SC98
- Several applications results to date

University of Oklahoma

(www.caps.ou.edu)

- Distributed data acquisition (NEXRAD radars)
- Distributed dynamic computing
- Distributed decision making and data dissemination
- Intelligent networking and data routing





University of North

Carolina (www.cs.unc.edu/Research/nano)

Security

The nanoManipulator

Search Netscape

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Print

Hope you caught the system running over the Internet2 at the Internet2 Spring '99 meeting in D.C. If not, you can catch an interview at the <u>VideoSpace page</u>. You need to download VideoCharger from that page, then point at the "April 99" link, then pull down the menu and select "nanoManipulator " choice, then click "Show Video".



The nanoManipulator (UNC-CH) - Netscape

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Reload

Home

🜾 Bookmarks 🏾 🦧 Location: http://www.cs.unc.edu/Research/nano/

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Back

Students in AP Biology at Orange County High School used the nanoManipulator across the Internet to see, feel and modify Adeno virus particles. This collaborative work between the departments of Computer Science, Physics & Astronomy and



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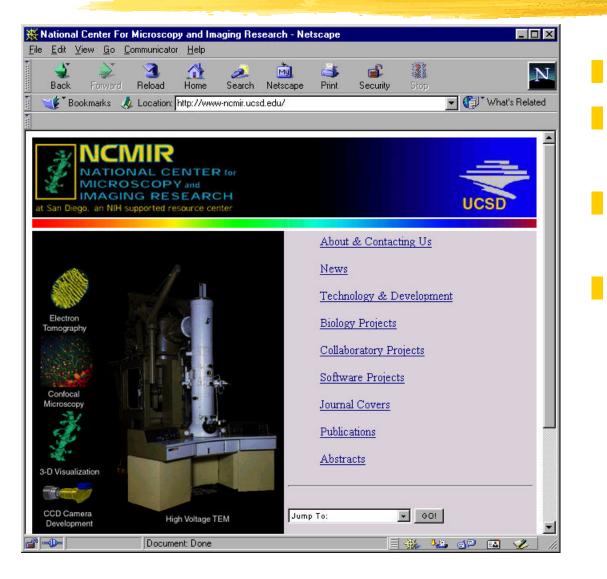
👻 🎧 🕻 What's Related

Education was enabled by an Information Technology grant from the office of the Chancellor of the University of North Carolina at Chapel Hill. To see the slides from a presentation of this work by Richard Superfine, click on the one you want: Slide 1, Slide 2, Slide 3, Slide 4, Slide 5, Slide 6, Slide 7.

Scanned-probe microscopes (SPMs) allow the investigation and manipulation of surfaces down to the atomic scale. The nanoManipulator (nM) system provides a virtual-environment interface to SPMs, which gives the scientist virtual telepresence on the surface, scaled by a factor of about a million to one.

- VR interface to "see/feel" atomic structures
- Strict latency requirements
 - Sustained bandwidth requirements
 - Low loss tolerance

UC San Diego (www-ncmir.ucsd.edu)



- International work
 - High throughput (35Mbps)
- Remote instrument control
- Multiple "channels" for controls and images

For more examples of work on the 100X network:

- NLANR newsletter and featured applications: http://www.nlanr.net/NLANRPackets/NLANR database
 FY99 award abstracts: http://www.interact.nsf.gov/cise/abst.nsf/anirabst98?OpenView
 Comprehensive list of HPC awards: http://www.interact.nsf.gov/CISE/ASC/CISEWeb.nsf/program_ani?OpenView&Count=500
 Internet2 applications and related information:
 - http://www.internet2.edu/html/news.html

NLANR

Campus support: network engineering, applications tuning, applications training

- Workshops: regional and national engineering and applications forums
- Focused efforts: Web100, OpenGL, FTP
- Performance measurement
- See: http://www.nlanr.net/

CISE Applications Awards

EIA (Experimental and Integrative Activities) - \$2M

- Tennessee: Logistical QoS through Application-driven Scheduling of Remote Storage
- Oregon Graduate Institute: CARE: Accessible Language Resources for Research and Education
- Pennsylvania/Boston: National Center for Sign Language and Gesture Resources
- USC: Advanced Semiconductor Technology Access for Educational Use

CISE Applications Awards

IIS (Information and Intelligent Systems) - \$2M

- Stanford--Digital Libraries Technologies Project
- Cornell--Project Prism at Cornell University: Information Integrity in Digital Libraries
- Arizona--High-Performance Digital Library Classification Systems: From Information Retrieval to Knowledge Management

CISE Applications Awards

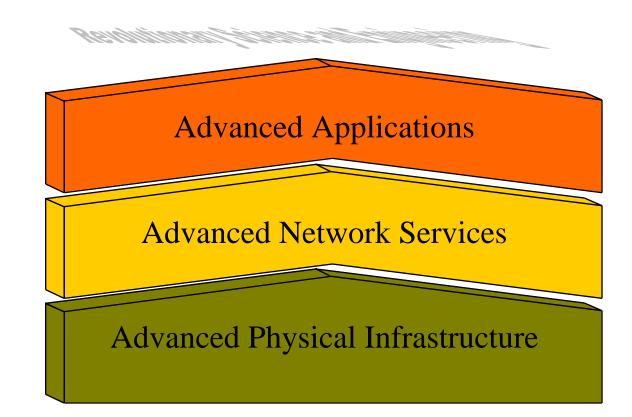
ACIR (Advanced Computation Infrastructure and Research) - \$3M

- NPACI: Data Intensive Computing Support and Digital Libraries for NGI Applications
- PACI: Persistent Globus Testbed
- PACI: Integrating NT Clusters with the Grid
- PACI: Very Large Distributed Databases
- PACI: Remote Instrument Control and Image Processing: Endto-End Quality of Service
- PACI: Grid Security and Privacy
- PACI: Distributed Storage and I/O Using Networked NT Clusters

High Performance Network Applications Team (HPNAT)

- Agencies participating: DARPA, DOD, DOE, NASA, NIH, NIST, NOAA, NSA, NSF, VA
- Collaboration examples:
 - Bridging the Gap Workshop
 - DOE Collaboratories Workshop
 - Virtual Collaboratories Workshop
 - SC99 demonstration coordination
 - DOE NGI PI meeting

NSF ANI Program Directions



ANI Future Program: SPIRAL

SPIRAL:

Synergistic Promotion of Infrastructure, Research, and Applications Linkages



SPIRAL Program

- Establish a system of advanced network services
- Establish support services and an overall system management/control function
- Support collaborative applications development based on access to these services
- Coordinate in a symbiotic way with the Advanced Network Research program