

*Mathematical and
Computational
Sciences*

**Advanced
Network
Technologies**

*Distributed
Computing and
Information
Services*

*Statistical
Engineering*

*Software
Diagnostics and
Conformance
Testing*

**Computer
Security**

**Information
Access and
User Interfaces**

**High
Performance
Systems and
Services**

Information Technology Laboratory

NIST

**U.S. DEPARTMENT OF COMMERCE
Technology Administration
National Institute of Standards and Technology**

C O N T E N T S

Introduction to ITL	1
ITL Technical Divisions	2
ITL Projects, Products, and Resources	10

About the National Institute of Standards and Technology

An agency of the U.S. Department of Commerce's Technology Administration, NIST strengthens the U.S. economy and improves the quality of life by working with industry to develop and apply technology, measurements, and standards. It carries out this mission through four interwoven programs:

- the Measurement and Standards Laboratories
- the Advanced Technology Program
- the Manufacturing Extension Partnership
- the Baldrige National Quality Program

*For more information about NIST,
see <http://www.nist.gov>.*

October 1999



U.S. DEPARTMENT OF COMMERCE

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Acting Under Secretary for Technology

National Institute of
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Raymond G. Kammer, Director

BARBARA GUTTMAN**WILLIAM O. MEHURON****KENDRA COLE**

Information Technology Laboratory

We welcome you, our customers and clients, to the Information Technology Laboratory (ITL), one of the Measurement and Standards Laboratories of the National Institute of Standards and Technology (NIST) of the Commerce Department's Technology Administration. ITL's mission is to strengthen the U.S. economy and improve the quality of life by working with industry to develop and apply technology, measurements, and standards for information technology (IT). Working in partnership with industry, academia, government, and consortia, we develop tests and test methods, quality assurance techniques, tools, models, reference data, and proof-of-concept implementations for emerging and forward-looking information technologies.

ITL's current research and development projects within eight technical divisions are listed in this brochure. Each project is linked to a relevant Web page or technical contact. An alphabetical cross-reference of ITL projects, products, and resources follows the division listings. We offer many opportunities for collaboration with industry organizations in these and other areas of mutual interest. Our management team is available for consultation on IT issues, solutions, and research directions.

To learn more about the challenging and exciting work of our laboratory, we invite you to view our Web site at <http://www.itl.nist.gov>. In partnership with industry, ITL will continue to produce the tools and metrics needed by U.S. industry in the new millennium to develop high quality IT products and services for the global marketplace. We look forward to hearing from you, our customers, and sharing our resources and experience.

*William O. Mehuron, Acting Director
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Mathematical and Computational Sciences Division

The Mathematical and Computational Sciences Division provides technical leadership within NIST in modern analytical and computational methods for solving scientific problems of interest to American industry.

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Mathematical Modeling Group
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Measurement Science for Optical
Reflectance and Scattering
<http://ciks.cbt.nist.gov/appearance/>

Micromagnetic Modeling
<http://math.nist.gov/oommf/>

OOF: Object Oriented Finite Element
Software for Materials Science
<http://www.ctcms.nist.gov/oof/>

Mathematical Software Group
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Digital Library of Mathematical Functions (DLMF)
<http://math.nist.gov/DigitalMathLib/>

Fortran 90 Bindings for OpenGL
<http://math.nist.gov/f90gl/>

Guide to Available Mathematical Software (GAMS)
<http://math.nist.gov/gams/>

Java Numerics
<http://math.nist.gov/javanumerics/>

Matrix Market
<http://math.nist.gov/MatrixMarket/>

NIST Sparse BLAS
<http://math.nist.gov/spblas/>

Optimization and Computational Geometry Group
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Advanced Network Technologies Division

The Advanced Network Technologies Division strives to provide the networking industry with the best in test and measurement technology.



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Networking for Pervasive Computing

High Speed Network Technologies Group
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All-Optical Transport Networks With
Wave Division Multiplexing
http://w3.antd.nist.gov/Projects/projects_antd.html#HighSpeed

Wireless Communication Technologies Group
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Characterization of Broadband Wireless
Communication Systems
Future Generation Wireless Communication Systems
Mobile Ad Hoc Networks
<http://w3.antd.nist.gov/wctg/index.html>

Multimedia and Digital Video Technologies Group
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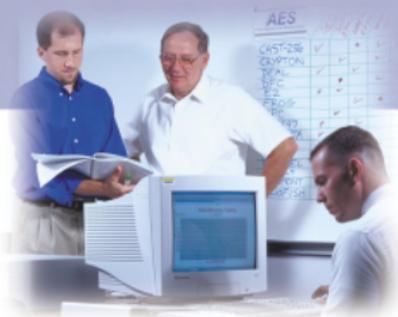
Streaming Synchronized Multimedia
<http://smil.nist.gov/player>

Internetworking Technologies Group
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Internet Security and Ipv6 Technologies
IP Quality of Service
Programmable Network Technologies
<http://www.antd.nist.gov/itg>

Compression Algorithms Group
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MPEG and Image Compression Tools
http://w3.antd.nist.gov/Projects/projects_antd.html#MultiMedia



Computer Security Division

The Computer Security Division enables organizations and individuals to use information technology with the assurance and trust that the confidentiality, integrity, reliability, and availability of information resources are protected.

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Security Technology Group
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Advanced Encryption Standard (AES)
<http://csrc.nist.gov/encryption/aes/>

Cryptographic Module Validation (CMV) Program
<http://csrc.nist.gov/cryptval/>

Encryption Key Recovery
<http://csrc.nist.gov/tacdfipsfkmi/>

IP Security (IPsec) and IPv6
<http://csrc.nist.gov/ipsec/>

Public Key Infrastructure (PKI)
<http://csrc.nist.gov/pki/>

Random Number Generation and Testing (RNG)
<http://www.itl.nist.gov/div893/projects/893-99-RNG.htm>

Systems and Network Security Group
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Computer Security Resource Clearinghouse (CSRC)
<http://csrc.nist.gov>

GITS Information Technology (IT) Security Training
<http://csrc.nist.gov/gits>

Mobile Agent Security
<http://csrc.nist.gov/mobileagents/index.html>

National Information Assurance Partnership (NIAP)
<http://niap.nist.gov/>

Information Access and User Interfaces Division



The Information Access and User Interfaces Division accelerates the development of technologies that allow intuitive, efficient access, manipulation, and exchange of complex information by facilitating the creation of measurement methods and standards.

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Spoken Natural Language Processing Group
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Spoken Language Technologies Benchmark Tests,
Corpora, and Software Tools
<http://www.itl.nist.gov/div894/894.01/slp.htm>

Natural Language Processing and Information
Retrieval Group
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Text REtrieval Conference (TREC)
<http://trec.nist.gov>

Java Information Retrieval Framework (JIRF)
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Visual Image Processing Group
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Face Recognition
Fingerprint/Law Enforcement Standards
Optical Information Processing
<http://www.nist.gov/itl/div894/894.03/>

Visualization and Virtual Reality Group
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DARPA Intelligent Collaboration and Visualization (IC&V)
Usability Engineering and WebMetrics
Visualization and Virtual Reality for Manufacturing
Visualization for Access to Complex Documents
<http://www.itl.nist.gov/div894/vvrg/>



High Performance Systems and Services Division

The High Performance Systems and Services Division enables effective application of high performance computing and communications systems in support of the U.S. information technology industry and NIST.

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Scalable Parallel Systems and Technologies Group
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Digital TV Application Software Environment (DASE)
<http://www.nist.gov/itl/div895/cmrf/>

Performance of Distributed Architectures
gordon.lyon@nist.gov

Information Storage and Integrated Systems Group
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Advanced Digital Data Storage: Metrology and
Interoperability for Optical Disc Storage
<http://www.nist.gov/itl/div895/isis/projects/>

Biometrics Technologies and Smart Cards - R&D,
Measurements and Standards
<http://www.nist.gov/itl/div895/isis/projects/>

Electronic Book: Concept Development and Standards
<http://www.itl.nist.gov/div895/isis/projects/>

Scientific Applications and Visualization Group
Judith E. Devaney, Manager
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Interoperable Message Passing Interface (IMPI) and
Conformance Tester
<http://impi.nist.gov/IMPI/>

High Performance Systems Usage Group
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Network and Telecommunications Systems Group
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Distributed Computing and Information Services Division



The Distributed Computing and Information Services Division provides the information technology resources, supporting infrastructure, applied research, and assistance to NIST staff, collaborators, and clients for application in the conduct of scientific, engineering, and administrative applications.

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Distributed Processing and Operating Systems Support
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Computer Security Initiative
Electronic Mail Enhancement
Enterprise Calendaring System
Paperless Facsimile Service

Windows NT Support Initiative
<http://winnt.cam.nist.gov>

Information Processing Support Group
James R. Graham, Manager
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Migration to Central Web Servers
ITL Web Page Revision
kathleen.simon@nist.gov

Administrative Computing Support Group
Robert Lee, Manager
(301) 975-4061, bob.lee@nist.gov

Commerce Standard Acquisition Reporting System (CSTARS)
terrence.king@nist.gov
Year 2000 Software/Hardware Remediation
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PC Support Group
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PC Support Baldrige Criteria
PC Support Managed Desktop
Travel Manager Upgrade
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Software Diagnostics and Conformance Testing Division

The Software Diagnostics and Conformance Testing Division develops software testing tools and methods that improve quality, conformance to standards, and correctness.

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Software Quality Group
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Automatic Generation of Tests from Formal Specifications
<http://hissa.nist.gov/~black/FTG/autotest.html>

Error, Fault, and Failure Data Collection and Analysis
<http://hissa.nist.gov/>

Programs for Evaluating Software Testing Tools and
Techniques (PESTTT)
<http://www.nist.gov/itl/div897/projects/projpestdt.htm>

Role Based Access Control
<http://hissa.nist.gov/rbac>

Standards and Conformance Testing Group
Lynne Rosenthal, Manager
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JAVA Conformance Testing
http://www.nist.gov/java_ca.htm

VRML Conformance Testing
<http://www.nist.gov/vrml.html>

XML/DOM Conformance Testing
<http://www.nist.gov/xml>

Interoperability Group
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Object Oriented Technology for Distributed Interactive
Learning
<http://www.nist.gov/itl/div897/projects/projoo.htm>

Requirements Collection for Forward-Looking Standards
<http://www.nist.gov/itl/div897/projects/projstd.htm>

Year 2000 (Y2K) Software Problem Information
Dissemination
<http://www.nist.gov/y2k>

Statistical Engineering Division



The Statistical Engineering Division seeks to catalyze scientific and industrial research through the application of statistical methods to the collection and analysis of data critical to NIST scientists and engineers.

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Rockwell Hardness Standards
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Measurement Process Evaluation Group
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Certification of Standard Reference Materials
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NIST/SEMATECH Engineering Statistics
Internet Handbook
<http://www.itl.nist.gov/div898/projects/handbook.html>

Statistical Modeling and Analysis Group
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Bayesian Metrology
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ITL Projects, Products, and Resources

(alphabetically with URLs listed if not given earlier in brochure)

- Advanced Digital Data Storage: Metrology and Interoperability for Optical Disc Storage - p. 6
- Advanced Encryption Standard (AES) - p. 4
- All-Optical Transport Networks with Wave Division Multiplexing - p. 3
- ANSI/NIST-ITL 1a-1997 -
ftp://sequoyah.nist.gov/pub/nist_internal_reports/ir_6011.pdf
- Architectural Description Languages for Component-Based Software Development - cdabrowski@nist.gov
- ATM ABR Service Traffic Management Conformance Test Tool -
http://www.hsnt.nist.gov/misc/hsnt/prd_abrtest.html
- ATM Network/HFC Network Simulator -
http://www.hsnt.nist.gov/misc/hsnt/prd_atm-sim.html
- ATM Private Network-Network Interface (PNNI) Simulator -
http://www.hsnt.nist.gov/misc/hsnt/prd_aprops.html
- Automatic Generation of Tests from Formal Specifications - p. 8
- Bayesian Metrology - p. 9
- Best Practice Recommendation for the Capture of Mugshots or Facial Images - http://www.itl.nist.gov/iaui/vip/face/bpr_mug3.html
- Biometrics Technologies and Smart Cards: R&D, Measurements and Standards - p. 6
- Calendar System - p. 7
- Cerberus: An IPsec Reference Implementation -
<http://www.antd.nist.gov/itg/cerberus/>
- Certification of Standard Reference Materials - p. 9
- CGM Version 4 Test Files -
http://www.itl.nist.gov/div897/ctg/cgm_form.htm
- Characterization of Broadband Wireless Communication Systems - p. 3
- Cobol 85 Test Suites -
http://www.itl.nist.gov/div897/ctg/cobol_form.htm
- Commerce Standard Acquisition Reporting System (CSTARS) - p. 7
- Common Criteria - <http://csrc.nist.gov/cc/>
- Computer Security Initiative - p. 7
- Computer Security Resource Clearinghouse (CSRC) - p. 4
- Cryptographic Module Validation (CMV) Program - p. 4
- DARPA Intelligent Collaboration and Visualization (IC&V) - p. 5
- Databases for Mugshot, Fingerprint, and OCR -
http://www.itl.nist.gov/iaui/894.03/databases/defs/vip_dbases.html
- Dataplot Statistical Software -
<http://www.itl.nist.gov/div898/software/dataplot.html/>
- Digital Library of Mathematical Functions (DLMF) - p. 2
- Digital TV Application Software Environment (DASE) - p. 6
- Electronic Book: Concept Development and Standards - p. 6
- Electronic Mail Enhancement - p. 7
- Encryption Key Recovery - p. 4
- Error, Fault, and Failure Data Collection and Analysis - p. 8
- Face Recognition - p. 5
- Fingerprint Databases -
http://www.itl.nist.gov/iaui/894.03/databases/defs/vip_dbases.html#finglist

Fingerprint/Law Enforcement Standards - p. 5
Form-Based Handprint Recognition System (Release 2.0) -
http://www.itl.nist.gov/iaui/894.03/databases/defs/nist_ocr.html
Fortran78 Test Suites -
http://www.itl.nist.gov/div897/ctg/fortran_form.htm
Fortran 90 Bindings for OpenGL - p. 2
Future Generation Wireless Communication Systems - p. 3
GITS Information Technology (IT) Security Training - p. 4
Guide to Available Mathematical Software (GAMS) - p. 2
Integrated ISO GIS Standards for Industry - cdabrowski@nist.gov
Integrated Services Protocol Instrument (RSVP/RTP Testing) -
<http://www.antd.nist.gov/antd/html/ispi.html>
Interoperable Message Passing Interface (IMPI) and Conformance
Tester - p. 6
IP Security (IPsec) and Ipv6 - pp. 3, 4
IPsec WWW-based Interoperability Tester (IPsec-WIT) -
<http://ipsec-wit.antd.nist.gov/>
IP Quality of Service - p. 3
ITL Public Web Page Revision - p. 7
Java Conformance Testing - p. 8
Java Information Retrieval Framework (JIRF) - p. 5
Java Numerics - p. 2
Matrix Market - p. 2
Measurement Science for Optical Reflectance and Scattering - p. 2
Micromagnetic Modeling - p. 2
Migration to Central Webservers - p. 7
Mobile Ad Hoc Networks - p. 3
Mobile Agent Security - p. 4
MPEG and Image Compression Tools - p. 3
MPI Data-Type Tools - <http://www.itl.nist.gov/div895/auto/>
Mugshot/Face Databases - <http://www.nist.gov/srd/nistsd18.htm>
MultiKron Series of Instrumentation Boards and Toolkits -
<http://www.nist.gov/itl/div895/cmr/multikron/multikron.html>
National Information Assurance Partnership (NIAP) - p. 4
Networking for Pervasive Computing - p. 3
NIST Network Emulation Tool (NIST Net) -
<http://www.antd.nist.gov/itg/nistnet/>
NIST/SEMATECH Engineering Statistics Internet Handbook - p. 9
NIST Sparse BLAS - p. 2
Object-Oriented Technology for Distributed Interactive Learning - p. 8
Omnitab 80 Spreadsheet for Statistical Analysis -
<http://www.itl.nist.gov/div898/software/omnitab.html>
OOF: Object Oriented Finite Element Software for Materials Science - p. 2
Optical Information Processing - p. 5
Paperless Facsimile Service - p. 7
PC Support Baldrige Criteria - p. 7
PC Support Managed Desktop - p. 7
Performance of Distributed Architectures - p. 6
PHIGS Test Suites - http://www.itl.nist.gov/div897/ctg/phigs_form.htm
POSIX Test Suites - http://www.itl.nist.gov/div897/ctg/posix_form.htm
Programmable Network Technologies - p. 3
Programs to Evaluate Software Testing Tools and Techniques
(PESTTT) - p. 8
Public Domain Pattern Level Classification Systems -
http://www.itl.nist.gov/iaui/894.03/databases/defs/vip_dbases.html
Public Key Infrastructure (PKI) - p. 4
Random Number Generation and Testing - p. 4

RDA Test Suite - http://www.itl.nist.gov/div897/ctg/rda_form.htm
RECIPE REGression Confidence Intervals for Percentiles -
<http://www.itl.nist.gov/div898/software/recipe/homepage.html>
Requirements for Forward-Looking Standards - p. 8
Rockwell Hardness Standards - p. 9
Role Based Access Control (RBAC) - p. 8
S-Check Tool for Assaying and Improving Performance
of Parallel and Networked Programs -
<http://www.cmr.nist.gov/scheck/tool.html>
SciMark - <http://math.nist.gov/scimark/>
Software Testing by Statistical Methods -
<http://www.nist.gov/stsm.html>
Spoken Language Scoring and Evaluations Software -
<http://www.nist.gov/speech/software.htm>
Spoken Language Technologies Project - p. 5
SQL Test Suite - http://www.itl.nist.gov/div897/ctg/sql_form.htm
Statistical Reference Datasets (StRD) -
<http://www.itl.nist.gov/div898/strd/>
Streaming Synchronized Multimedia - p. 3
Technology Transfer of Conformance Testing Programs -
<http://www.nist.gov/ctdirectory.html>
Template Numerical Toolkit - <http://math.nist.gov/tnt/>
Text REtrieval Conference (TREC) - p. 5
Translation of Deneb Robotics Formats to VRML (source code) -
[http://ovrt.nist.gov/projects/mfg/SIMA/deneb2vrml/
deneb2vrml.html](http://ovrt.nist.gov/projects/mfg/SIMA/deneb2vrml/deneb2vrml.html)
Travel Manager Upgrade - p. 7
TREC Test Collections on CD-ROM -
http://trec.nist.gov/data/docs_eng.html
Unravel Program Slicer -
<http://www.nist.gov/itl/div897/sqg/unravel/unravel.html>
Usability Engineering and WebMetrics - p. 5
Visualization and Virtual Reality for Manufacturing - p. 5
Visualization for Access to Complex Documents - p. 5
VMView Java Diagnostic Tool -
<http://www.itl.nist.gov/div897/ctg/java/vmview/>
VRML Conformance Testing - p. 8
WebMetrics Tool Suite - <http://zing.ncsl.nist.gov/webmet/>
WebSubmit Web-based Interface to High Performance
Computing Resources -
<http://www.itl.nist.gov/div895/sasg/websubmit/websubmit.html>
Windows NT Support Initiative - p. 7
Working Model 3D Translator to VRML -
<http://ovrt.nist.gov/work3d/>
XML/DOM Conformance Testing - p. 8
Year 2000 Software/Hardware Remediation - p. 7
Year 2000 (Y2K) Software Problem Information Dissemination - p. 8

ITL Publications - <http://www.nist.gov/itl/lab/csl-pubs.htm>
Current ITL products - <http://www.itl.nist.gov/product2.htm>

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NOTE: Reference to specific commercial products or brands is for information purposes only; no endorsement or recommendation by the National Institute of Standards and Technology, explicit or implicit, is intended or implied.

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