

INSIDE THIS ISSUE

ITL's National Software Reference Library Receives Innovation Award

ITL's National Cybersecurity Center of Excellence (NCCoE) Focuses on Identity and Access Solutions

ITL Performs Multilingual Evaluation of Key Word Search Technology

Staff Recognition

Selected New Publications

Upcoming Technical Conferences



July –August 2014

Issue 130

ITL's National Software Reference Library Receives Innovation Award

The National Software Reference Library (NSRL) is the recipient of the 2014 [National Digital Stewardship Alliance \(NDSA\)](#) Innovation Award. Selected from more than 30 nominations, the [National Software Reference Library](#) is being recognized for their substantial leadership in building a national collection of software, developing and sharing workflows and approaches for software preservation, and for modeling approaches to corpus analysis of born digital collections.

Without efficient methods, investigation of crimes involving computer files requires a tremendous amount of effort. The NSRL provides an automated method for eliminating known files with verified metadata from an investigation, leaving unknown files and files with suspicious metadata to be reviewed. The NSRL consists of four components:

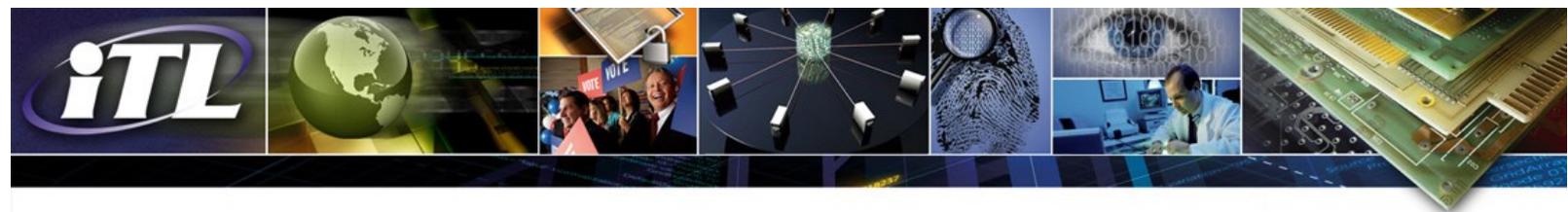
A large collection of software packages. Software is donated by software manufacturers and other organizations or purchased. These packages (including physical media and purely electronic) include both new and older versions of operating systems, database management systems, utilities, graphics images, component libraries, etc. The electronic library is on an isolated NIST network.

A database. The NSRL database contains detailed information about the files that make up the packages listed above.

The Reference Data Set (RDS). This data set contains signatures and identifying metadata, but not the software files. The metadata includes manufacturer name, operating system information, product information, application type, cryptographic information, and file storage information. Since its release in 2001, the RDS has grown to include over 100 million file signatures.

A research environment. This environment facilitates the collaboration of NIST with researchers to access NSRL's collection of software packages.

Computer forensics examiners, federal, state, and local law enforcement, government agencies, and industry organizations that perform investigations on computer technology use the NSRL to obtain digital evidence much more quickly and efficiently. Researchers also use the resource to quickly and automatically reduce the amount of data involved in experiments, where known files need to be identified.



ITL's National Cybersecurity Center of Excellence (NCCoE) Focuses on Identity and Access Solutions

A partnership of NIST, the State of Maryland, and Montgomery County, the [NCCoE](#) facilitates innovation through the rapid identification and adoption of practical standards-based cybersecurity solutions. The center is developing example solutions so that energy companies can better control physical and logical access to their resources, including buildings, equipment, information technology, and industrial control system networks and systems.

NCCoE recently hosted 20 representatives from 13 cybersecurity technology companies that responded to a March Federal Register notice calling for participation. Vendors of commercial technologies for identity and access management will provide the products that are modules in the end-to-end approach to this challenge. The companies presented their products' capabilities and learned about the cooperative research and development agreements (CRADAs) that will guide their collaboration with NIST. Once the CRADAs are signed, collaboration will begin under the direction of the NCCoE project manager.

The solution developed by these collaborators in the NCCoE labs will help to:

- Reduce opportunities for attack or error, as well as the impact of such incidents on energy delivery, thereby lowering overall business risk;
- Increase the probability that investigations of attacks or anomalous system behavior will reach successful conclusions;
- Improve accountability and traceability, leading to valuable operational lessons learned; and
- Simplify regulatory compliance by automating generation and collection of access information.

ITL Performs Multilingual Evaluation of Key Word Search Technology

ITL recently performed two additional multilingual evaluations of KeyWord Search (KWS) technology. These evaluations assessed the capability of software to detect a specific term, defined textually in the language's native orthography, within a conversational telephone speech recording. The first evaluation assessed performance of systems developed by performers in year 2 of the Intelligence Advanced Research Projects Activity (IARPA) Babel Program. The second evaluation, OpenKWS, leveraged tools and data resources to assess the technology across a wider research community. These evaluations were the culmination of a joint effort by the Babel Program's testing and evaluation team, which included IARPA, ITL, MIT Lincoln Labs, University of Maryland's Center for Advanced Study of Language, and

MITRE to develop language resources for KWS systems in five languages.

The OpenKWS evaluation was open to the entire research community. The evaluations assessed systems across different factors expected to affect performance, including the amount of transcribed training data, the size of language resources brought to bear, and system retraining with knowledge of the keywords. Twelve teams participated in OpenKWS this year, three of which were new to the evaluation. Four teams were members of IARPA's Babel Program (namely, the BABELON, LORELEI, RADICAL, and SWORDFISH teams) and the other eight teams represented various organizations from around the world, including China, Israel, Singapore, and the United States. Participating teams represented both industry and academia. The OpenKWS community of researchers will discuss the evaluation and the results in early July, after which results will be made public on the [NIST OpenKWS14 website](#).

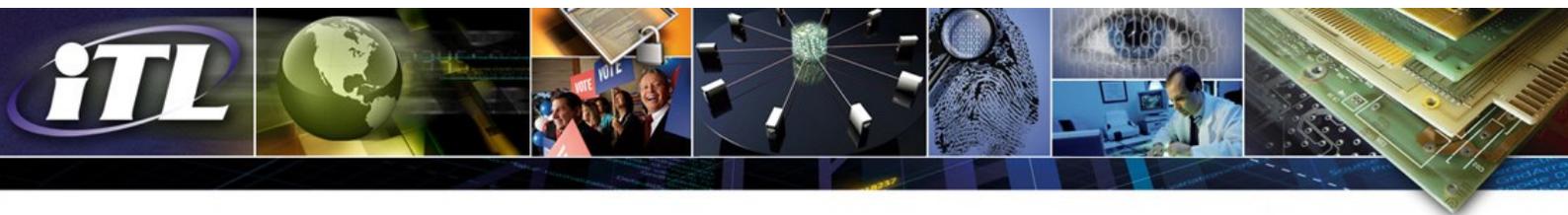
STAFF RECOGNITION

Ron Boisvert, Chief of ITL's Applied and Computational Mathematics Division, received the 2014 Mathematics and Computer Sciences Award from the Washington Academy of Sciences. Boisvert was recognized for outstanding contributions to computational science, mathematical software, and applied mathematics.

Manny Knill, of ITL's Applied and Computational Mathematics Division (in Boulder) was named one of 12 Arthur S. Flemming Award winners for 2013. Administered by the Trachtenberg School of Public Policy and Public Administration at George Washington University, these awards recognize outstanding federal workers with less than 15 years of service. Knill was recognized for his accomplishments in the field of quantum information theory.

Adam Sedgewick, ITL's Senior IT Policy Advisor, was selected by the Armed Forces Communication and Electronics Association (AFCEA) Bethesda Chapter as one of the winners of the 7th Annual Governmentwide Initiatives Excellence Awards. These awards recognize individuals or groups whose contributions in information technology have significance beyond their organization. Sedgewick was selected for the security category.

Kevin Mangold was recently selected to participate in the 2014 International Electrotechnical Commission (IEC) Young Professionals Program. The three young professionals selected to represent the United States will attend the IEC 2014 General Meeting to be held in November 2014, in Tokyo, Japan, and participate in the workshop on IEC standardization strategies and conformity assessment.



Selected New Publications

[Guide for Applying the Risk Management Framework to Federal Information Systems](#)

Joint Task Force Transformation Initiative

NIST Special Publication 800-37 Revision 1

February 2010 (includes updates as of 6/5/14)

This publication provides guidelines for applying the Risk Management Framework (RMF) to federal information systems. The RMF promotes the concept of near real-time risk management and ongoing information system authorization through the implementation of robust continuous monitoring processes, providing senior leaders the necessary information to make cost-effective, risk-based decisions with regard to the organizational information systems supporting their core missions.

[Guidelines on Mobile Device Forensics](#)

By Rick Ayers, Sam Brothers, and Wayne Jansen

NIST Special Publication 800-101, Revision 1

May 2014

Mobile device forensics is the science of recovering digital evidence from a mobile device under forensically sound conditions using accepted methods. This guide provides an in-depth look into mobile devices and explains technologies involved and their relationship to forensic procedures. The guide discusses procedures for the validation, preservation, acquisition, examination, analysis, and reporting of digital information.

[The ghost in the machine: Don't let it haunt your software performance measurements](#)

By Vreda Pieterse and David Flater

NIST Technical Note 1830

April 2014

This paper describes pitfalls, issues, and methodology for measuring software performance. Ideally, measurement should be performed and reported in such a way that others will be able to reproduce the results in order to confirm their validity. Repeatability of experiments, comparability of reported results, and verifiability of claims that are based on such results can be achieved only when measurements and reporting procedures can be trusted.

[Human Engineering Design Criteria Standards Part 1: Project Introduction and Existing Standards](#)

By Susanne Furman, Mary Theofanos, and Hannah Wald

NISTIR 7889

April 2014

The Department of Homeland Security (DHS) requires general human systems integration (HSI) criteria for the design and development of human-machine interfaces for their technology, systems, equipment, and facilities. The goal of the DHS Human Systems Engineering Project was to identify, develop, and apply a standard process to enhance technology and system design, system safety, and operational efficiency. The project manager partnered with ITL's Visualization and Usability Group to advance this effort. The goal of this phase of the project was to identify and review the body of existing human factors and HSI standards, best practices, and guidelines in order to map these to potential DHS needs, technology, and processes.

[LTE Physical Layer Performance Analysis](#)

By Wen-Bin Yang and Michael Souryal

NISTIT 7986

May 2014

This report presents results of a physical layer performance study for all MCSs (from MCS0 to MCS28) in terms of block error rate (BLER) and spectral efficiency. The results are obtained by using the Steepest Ascent¹ LTE toolbox for MATLAB which provides functions for modeling the LTE physical layer based upon 3GPP specifications. The performance measures for each MCS are evaluated as a function of signal to noise ratio (SNR), MIMO configuration, and 3GPP multipath fading channel. The 3GPP channels include models for pedestrian, vehicular, and typical urban environments. The results of this study can be used in higher-level modeling tools such as cellular network planning and network modeling tools that take abstractions of physical layer performance as input.

[Exploring the Methodology and Utility of Standardized Latent Fingerprint Matcher Scoring](#)

By Vladimir N. Dvornychenko and George W. Quinn

NISTIR 7992

March 2014

Automated searches of fingerprints against a repository/database are important tools of the forensic community. Systems performing these searches are referred to as Automated Fingerprint Identification Systems (AFISs). The output of an AFIS is a fairly small set of prospective candidates with attendant matching scores. These scores provide an indication of how likely a particular candidate is a true mate of the search fingerprint. One difficulty in interpreting matching scores in usage is that there is no accepted standard for its range and exact meaning. This report proposes a standardization of the scoring system.

Selected New Publications (continued)

[Applied and Computational Mathematics Division, Summary of Activities for Fiscal Year 2013](#)

Ronald Boisvert, Editor
NISTIR 7994
March 2014

This report summarizes the technical work of the Applied and Computational Sciences Division of the Information Technology Laboratory (ITL). Part I (Overview) provides a high-level overview of the Division's activities, including highlights of technical accomplishments during the previous year. Part II (Features) provides further details on five projects of particular note this year. This is followed in Part III (Project Summaries) by brief synopses of all technical projects active during the past year. Part IV (Activity Data) provides listings of publications, technical talks, and other professional activities in which Division staff members have participated. The reporting period covered by this document is from October 2012 through December 2013.

[Identifying Face Quality and Factor Measures for Video](#)

By Yooyoung Lee, P. Jonathon Phillips, James J. Filliben, J. Ross Beveridge, and Hao Zhang
NISTIR 8004
May 2014

This paper identifies important factors for face recognition algorithm performance in video. The goal of this study is to understand key factors that affect algorithm performance and to characterize the algorithm performance. We evaluate four factor metrics for a single video as well as two comparative metrics for pairs of videos. The study investigated the effect of nine factors on three algorithms using the Point-and-Shoot Challenge (PaSC) video dataset.



Upcoming Technical Conferences

[SHA-3 2014 Workshop](#)

Date: August 22, 2014
Place: University of California Santa Barbara
Sponsor: NIST

The goal of the workshop is for the community to help NIST get a better understanding of the Secure Hash Standard (SHA)-3 and its possible applications, with particular focus on additional modes of operation for SHA-3 that might be worth standardizing in the future.

NIST contact: [Shu-jen Chang](#)

[2014 Global Identity Summit](#)

Dates: September 16-18, 2014
Place: Tampa Convention Center, Tampa, Florida
Sponsors: NIST and National Security Agency

Presented by the Biometric Consortium and the Armed Forces Communications and Electronics Association, this conference promotes information exchanges on scientific and technical advancements, operational requirements, and future strategic directions of biometrics and identity management. It focuses on solutions for the corporate, defense, and homeland security communities.

NIST contact: [Fernando Podio](#)

Disclaimer: Any mention of commercial products or reference to commercial organizations is for information only; it does not imply recommendation or endorsement by the National Institute of Standards and Technology nor does it imply that the products mentioned are necessarily the best available for the purpose.



The Information Technology Laboratory (ITL) is a major research component of the National Institute of Standards and Technology (NIST). As a world-class measurement and testing laboratory encompassing a wide range of areas of computer science, mathematics, statistics, and systems engineering, our research program supports NIST's mission to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. ITL cybersecurity experts collaborate to develop cybersecurity standards, guidelines, and associated methods and techniques for federal agencies and industry. Our mathematicians and statisticians collaborate with measurement scientists across NIST to help ensure that NIST maintains and delivers the world's leading measurement capability. ITL computer scientists and other research staff provide technical expertise and development that underpins national priorities such as cloud computing, the Smart Grid, homeland security, information technology for improved healthcare, and electronic voting. We invite you to learn more about how ITL is enabling the future of the nation's measurement and standards infrastructure for information technology by visiting our website at <http://www.itl.nist.gov>.

ITL Editor: Elizabeth B. Lennon
National Institute of Standards and Technology
100 Bureau Drive, Stop 8900
Gaithersburg, MD 20899-8900
Phone: (301) 975-2832
Fax: (301) 975-2378
Email: elizabeth.lennon@nist.gov

The NIST campus in
Gaithersburg, Maryland.

Credit: Katherine Green

TO SUBSCRIBE TO THE
ELECTRONIC EDITION OF
THE ITL NEWSLETTER, GO
TO
[ITL HOMEPAGE](#)