Information Technology Laboratory Newsletter

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NIST Voting Program

NIST started its Voting Program in 2003, after Congress passed the Help America Vote Act (HAVA) of 2002 to, among other things, “establish minimum election administration standards for States and units of local government with responsibility for the administration of Federal elections." Under HAVA, the NIST Voting Program has assisted the Election Assistance Commission (EAC) with the development of voluntary voting system guidelines (VVSG) that specify functional and testing-related requirements for voting devices. In addition, we have authored a variety of guidance reports and worked to address voting system testing, transparency, and overall integrity. NIST also chairs the Technical Guidelines Development Committee (TGDC), which has overall responsibility for recommending the guidelines to the EAC for adoption and use in their certification program, which tests voting devices against the guidelines.

Since 2003, NIST has worked to update existing VVSG and develop new versions. The NIST Voting Program has developed recommendations for voting-related security and for voting system usability and accessibility for voters with disabilities. We have also developed testing-related material to improve the uniformity of testing at voting system test labs and developed a project to establish a common data format (CDF) for election data. With NIST’s National Voluntary Laboratory Accreditation Program, we have performed assessments of voting system test labs and worked with the labs to improve overall testing. The CDF work has resulted in an open XML-based format for reporting detailed election results and, on election night on November 8, will be used by the State of Ohio to report election results to the media and public (the XML files will be available on Ohio’s Secretary of State website).

Currently, the voting program is beginning the development of a completely new version of the VVSG and is using a series of public working groups to provide input into the development process and to make recommendations for new requirements. The working groups consist of election officials, vendors, experts in various aspects of elections, and the general public. The goal is to develop a VVSG that has broad support across the entire elections community. See our NIST Voting Program website.

Commission on Enhancing National Cybersecurity

The Commission on Enhancing National Cybersecurity recently hosted its sixth public meeting at American University's Washington College of Law in Washington, D.C. The purpose of the meeting was to discuss the challenges and opportunities for organizations and consumers in securing the digital economy. A series of four panels discussed international concerns, the current state of cybersecurity, growing and securing the digital economy, and innovation and technology in the government. Meeting discussions provided input to help the Commission form detailed recommendations to strengthen cybersecurity in both the public and private sectors. ITL provides support services to the Commission.

ITL Language Evaluation Series

The LoReHLT evaluation series, initiated in conjunction with the Defense Advanced Research Projects Agency (DARPA) Low Resource Languages for Emergent Incidents (LORELEI) program, seeks to assist humanitarian and disaster relief personnel by providing human language technology (HLT) capability to assess emergent incidents in locations where language resources are limited. The focus is to develop techniques that will work across many languages, in particular applying universals learned from languages with abundant resources to those with less in order to provide accurate and rapid situation awareness in emergent incidents or disaster scenarios. ITL staff worked with DARPA and the Linguistic Data Consortium to design and implement an evaluation to assess such capability.

The first evaluation focused on basic tasks with the challenge being the language and developing language universals. The evaluation supported three tasks: (1) machine translation (MT – translate text documents from one language to another); (2) named entity recognition (NER – identify named mentions in those documents and classify the mentions into predefined types); and (3) situation frame (SF – identify frames representing emergent situations in those documents). While the incident language under test, Uyghur, remained unknown until the start of the evaluation, language training data for system development were provided in the two related languages of Turkish and Uzbek. The evaluation was conducted along three checkpoints, representing system development states after one day, one week, and one month. Participants had a fixed amount of time to process the test data at three checkpoints to assess the system performance over time, as more information in the incident language was made available.

The evaluation took place during the summer of 2016 with participation from 8 teams from 16 organizations ranging from academic to industry. A follow-up workshop looked at evaluation results. Preliminary results across all three tasks indicate general performance improvement across the checkpoints. Researchers will perform additional analysis to understand challenges faced by the systems and to identify general or new universal features.

ITL Focuses on the Role of Standards in Patient Safety

ITL recently hosted the Workshop on Role of Standards in Preventing and Mitigating Health IT Patient Safety Risks. ITL, the Office of the National Coordinator for Health Information Technology (ONC), and the Association for the Advancement of Medical Instrumentation (AAMI) co-sponsored the event. The workshop brought together more than 100 health IT stakeholders to share best practices and review the fundamentals of risk prevention and mitigation that apply to health IT.

Health IT standards are part of the foundation needed to deliver high-quality, patient-centric care. The industry continues to gain a better understanding of the relationship between managing risk and providing quality care through the safe use of health IT. Workshop participants received updates on the latest standards development process related to risk prevention and mitigation, quality assurance, and safety-related usability, learned about recent findings from studies conducted on this subject, and defined the path forward for risk prevention and mitigation that apply to health IT.

NIST Cloud Computing Program

The NIST Cloud Computing Program (NCCP) recently held its 9th Forum and Workshop. The theme of the event was “Cloud and the Interconnected World.” The event was attended by an international audience of about 200 attendees and featured 35 speakers from government, industry, and standards development organizations. Speakers focused on the role of cloud computing in addressing the challenges of an interconnected world, and the necessary building blocks for the vision and standards that make an interconnected world possible. NIST Fellow Ron Ross presented a keynote address entitled “Security by Design,” which outlined the role that cloud computing can play in creating a more secure IT infrastructure for the U.S. government.

Staff Accomplishments

Xiao Tang, a supervisory physical scientist in ITL’s Applied and Computational Mathematics Division, was elected a 2016 Fellow of the American Physical Society. Tang was recognized for outstanding contributions in optical technologies and systems, with application to quantum communications, spectrometry, and digital preservation.

Selected New Publications

Certification Pathway for Downsampling 1000 ppi Fingerprint Friction Ridge Imagery to 500 ppi

By John Libert, John Grantham, and Craig Watson
NIST Special Publication 500-306
August 2016

This document describes the procedure by which fingerprint image downsampling procedures will be evaluated with respect to conformance to the NIST guidance for sample rate reduction of 1000 ppi friction ridge images to 500 ppi as specified in NIST SP 500-289. The guidance is to be followed whenever 1000 ppi images are to be prepared for comparison to legacy 500 ppi fingerprint databases for submittal to the FBI's Next Generation identification system. The document provides instructions on how to run the protocol and submit results to NIST for evaluation.

Guide to Cyber Threat Information Sharing

By Chris Johnson, Lee Badger, David Waltermire, Julie Snyder, and Clem Skorupka
NIST Special Publication 800-150
September 2016

This publication provides guidelines for establishing and participating in cyber threat information sharing relationships. This guidance helps organizations establish information sharing goals, identify cyber threat information sources, scope information sharing activities, develop rules that control the publication and distribution of threat information, engage with existing sharing communities, and make effective use of threat information in support of the organization's overall cybersecurity practices.

Guideline for Using Cryptographic Standards in the Federal Government: Directives, Mandates and Policies

By Elaine Barker and William C. Barker
NIST Special Publication 800-175A
August 2016

This document is part of a series that provides guidance to the federal government for using cryptography and NIST's cryptographic standards to protect sensitive, but unclassified digitized information during transmission and while in storage. It provides guidance on the determination of requirements for using cryptography. It includes a summary of laws and regulations concerning the protection of the federal government's sensitive information, guidance regarding the conduct of risk assessments to determine what needs to be protected and how best to protect that information, and a discussion of the relevant security-related documents. The companion document SP 800-175B discusses the cryptographic methods and services to be used.

Tattoo Recognition Technology – Challenge (Tatt-C) – Outcomes and Recommendations

By Mei Ngan, George W. Quinn, and Patrick Grother
NISTIR 8078 Revision 1.0
September 2016

NIST conducted the Tattoo Recognition Technology-Challenge (Tatt-C) as an initial research challenge that provided operational data (provided by the FBI) and use cases to engage the research community into advancing research and development into automated image-based tattoo technologies and to assess the state of the art to determine what methods are effective and viable for pertinent operational scenarios. Tatt-C builds upon earlier NIST efforts in biometric challenge problems which have helped promote development, advance the state of the art, and benchmark progress in different areas of biometrics.

Advanced Identity Workshop on Applying Measurement Science in the Identity Ecosystem: Summary and Next Steps

By Michael E. Garcia and Paul A. Grassi
NISTIR 8103
September 2016

In January 2016, ITL hosted the Applying Measurement Science in the Identity Ecosystem Workshop to discuss the application of measurement science to digital identity management. This document summarizes the concepts and ideas presented at the workshop and serves as a platform to receive feedback on the major themes discussed at the event.

Government Data De-Identification Stakeholders Meeting June 20, 2016, Meeting Report

By Simson L. Garfinkel
NISTIR 8150
September 2016

The first Government Data De-Identification Stakeholder's Meeting was held at NIST in June 2016. Eighty participants from 67 government agencies attended. Following the keynote, five panels discussed agency case studies, agency needs, available solutions, governance, and evaluation of de-identification techniques. In conclusion, attendees agreed on the need for collaboration and the sharing of techniques for the de-identification of government data.

Upcoming Technical Conferences

NSCI Seminar: Roadmap for Building a Quantum Computer
Date: November 15, 2016
Place: NIST, Gaithersburg, Maryland
Sponsor: National Strategy Computing Initiative (NSCI) Committee
Cost: None

This talk will overview the basic strategy and roadmap for the quantum-AI project at Google, which has the goal of building a useful quantum computer.

NIST contact: Barry Schneider, barry.schneider@nist.gov

3rd International Conference on Research in Security Standardisation
Dates: December 5-6, 2016
Place: NIST, Gaithersburg, Maryland
Cost: $268 with catering services; $114 without catering services

The purpose of this conference is to discuss the many research problems deriving from studies of existing standards, the development of revisions to existing standards, and the exploration of completely new areas of standardisation. Indeed, many security standards bodies are only beginning to address the issue of transparency, so that the process of selecting security techniques for standardisation can be seen to be as scientific and unbiased as possible.

NIST contact: Lily Chen, lily.chen@nist.gov

NSCI Seminar: An Overview of High Performance Computing and Benchmark Changes for the Future
Date: December 6, 2016
Place: NIST, Gaithersburg, Maryland
Sponsor: National Strategy Computing Initiative (NSCI) Committee
Cost: None

This talk will examine how high performance computing has changed over the last ten years and look toward the future in terms of trends. These changes have had and will continue to have a major impact on our numerical scientific software. A new generation of software libraries and algorithms are needed for the effective and reliable use of (wide area) dynamic, distributed, and parallel environments.

NIST contact: Barry Schneider, barry.schneider@nist.gov

NSCI Seminar: New Technologies for Improved Computer Performance
Date: December 20, 2016
Place: NIST, Gaithersburg, Maryland
Sponsor: National Strategy Computing Initiative (NSCI) Committee
Cost: None

Tremendous progress has been made in building computer systems with higher performance over the last several decades. However, the need to build systems with even higher performance exists in a number of key strategic areas. We will review some of the progress that has been made in developing the materials and processes to enable performance increases at the device level.

NIST contact: Barry Schneider, barry.schneider@nist.gov

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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.

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The NIST campus at Gaithersburg, MD.

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