National Institute of Standards and Technology

Technical Colloquium
Quantifying the weight of forensic evidence

May 5-6, 2016

(2016-04-29) DRAFT PROGRAM

FORENSICS@NIST

The National Institute for Standards and Technology (NIST) is happy to announce the agenda for the technical colloquium on Quantification of the Weight of Forensic Evidence. The purpose of the technical colloquium is to facilitate a technical discussion about theories and current approaches and practices for assigning the weight of evidence. Issues related to statistical methods for quantifying the weight of evidence and their introduction into courts of law, are of great interest and importance in forensic science. The technical colloquium, which is part of the IBPC2016, will be held May 5-6 at NIST in Gaithersburg, Maryland.

NIST has conducted and supported forensic science research for many decades, dating back to 1932, when the FBI consulted with NIST (then the National Bureau of Standards) experts during the establishment of the FBI Laboratory. NIST is a co-chair of the National Commission on Forensic Science, whose aims are to enhance the practice and improve the reliability of forensic science. The NIST Forensic Science Research Program coordinates research in disciplines such as pattern and impression evidence (fingerprint, shoeprint, firearms), biology/DNA, drugs and toxicology, trace evidence/chemistry and digital and multimedia evidence. Additionally, NIST has established the Organization of Scientific Area Committees (OSAC) to support the development and promulgation of forensic science consensus documentary standards and guidelines, and to ensure that a sufficient scientific basis exists for each discipline. NIST also has a Forensic Science Center of Excellence. The Center for Statistics and Applications in Forensic Evidence, a consortium led by Iowa State University supports NIST's efforts to advance the utility of probabilistic methods to enhance forensic analysis.

Organizers
Elham Tabassi, Reva Schwartz
NIST

Speakers: forensic scientists, statisticians, lawyers, practitioner

Target audience: forensic scientists, researchers, statisticians, lawyers, practitioner

IBPC Conference, May 3-5	Satellite Session, May 5-6
International Biometric Performance Conference 2016 http://www.nist.gov/itl/iad/ig/ibpc2016.cfm	Technical Colloquium Quantifying the weight of forensic evidence
Red Auditorium, NIST	Green Auditorium, NIST
08:30 – 18:00	08:30 – 18:00

Registration	**https://appam.certain.com/profile/form/index.cfm?PKformID=0x2990790be** **(IBPC2016 registrants are already registered for the TC)**	**Registration Deadline: April 28, 2016. All speakers and attendees must register.**
Hotels + Logistics	**http://www.nist.gov/itl/iad/ig/ibpc-technical-colloquium.cfm**	
Maps + Directions	**http://www.nist.gov/public_affairs/visitor/index.cfm**	
Colloquium Homepage	**http://www.nist.gov/itl/iad/ig/evidential_value.cfm**	

Thursday May 5 Green Auditorium	Friday May 6 Portrait Room
0800 Registration	0800 Registration
0830 Welcome introduction, goals, logistics **Dr. Richard R. Cavanagh**, Director of the Special Programs Office, NIST	0830 Overview of NIST forensic research **Susan Ballou**, Forensic Science program manager, NIST
0900 *Perspectives and Challenges from NIST Involvement in Forensic Science*, **John Butler**, National Institute of Standards and Technology	0840 *The interpretation of DNA evidence*, **John Buckleton**, National Institute of Standards and Technology
0945 *Legal, Statistical, and Forensic Science Conceptions of the Weight of Evidence*, **David Kaye**, Penn State Law	0925: *Quantitative Firearms and Toolmark Analysis: New Developments and Software*, **Nicholas Petraco**, John Jay College of Criminal Justice
1030 Break	1000 Break
1045 – *What is probability*, **Jim Wayman**, San Jose State University	1030 *A new paradigm for forensic science and its implementation in forensic voice comparison*, **Geoffrey Stewart Morrison** and **Ewald Enzinger,** Morrison & Enzinger, Independent Forensic Consultants
1130 *Communicating Weight of Forensic Evidence Using a LR: Whose prior, Whose likelihoods, and Whom are we kidding?* **Hari Iyer** and **Steve Lund**, National Institute of Standards and Technology	1115 Discussion Moderator: **Joe Campbell,** MIT Lincoln Laboratory
1200 Lunch (on your own)	1200 Lunch (on your own)
1330 *Evaluating and Reporting Forensic Evidence Using the LR Framework: Statistical Challenges*, **Marjan Sjerps**, Netherland Forensic Institute	1330 *Panel on Similarity based LR models*, **Chair: Cedric Neumann**, South Dakota State University Panelists: Doug Armstrong, Marjan Sjerps , Hal Stern, Steve Lund
1400 Discussion	
1430 **Break**	1500 Break
1500 *New approaches to the quantification of trace evidence for source identification*, **Danica Ommen, Chris Saunders (**South Dakota State University) and **JoAnn Buscaglia,** FBI	1530 *Panel on LR Confidence interval*, **Chair: Chris Saunders,** South Dakota State University Panelists: Danica Ommen, Marjan Sjerps , Hal Stern, Hari Iyer
1530 *Integrating Probabilistic Logic and Quantitative Data into Practice: Latent Print Examination*, **Henry Swofford,** U.S. Army Criminal Investigation Laboratory	
1600 Discussion. Moderator **Bill Thompson**, UC Irvine	1700 Wrap up

Panel on similarity based likelihood ratio

Chair: Cedric Neumann, South Dakota State University

Panelists:

* Doug Armstrong, South Dakota State University
* Marjan Sjerps, Netherland Forensic Institute
* Hal Stern, University of California at Irvine/CSAFE
* Steven Lund, National Institute of Standards and Technology

The legal and scientific push towards the statistical quantification of the weight of forensic evidence is impeded by the complexity the various evidence types encountered on crime scenes. Complex forms of forensic evidence, such as fingerprints, tool marks, shoe prints or chemical profiles often live in high dimensional and heterogenous spaces. The need to reduce the complexity of the models has resulted in the apparition of a series of ad-hoc measures of the probative value of some forms of forensic evidence, which rely, by proxy, on the level of similarity (or score) between pairs of objects, instead of being directly based on sets of measurements of these objects. The appropriateness of these ad-hoc methods has been challenged at several occasions. The challenges are based on the argument that these methods do not address the questions of interest to forensic scientists and courts, and do not provide a coherent (in the statistical sense) way of updating prior information in a Bayesian framework. Proponents of these methods have made the argument that since probabilities are inherently subjective (or personal), the probative values calculated by these methods were merely an expression of the personal weight assigned by the forensic scientist to the evidence, and therefore were acceptable. The aim of this panel is to discuss the appropriateness of score-based methods as a mean to quantify and report the weight of forensic evidence, and the place of these methods in a coherent Bayesian paradigm.

Panel on the use of interval quantifications for the value of forensic evidence

Chair: Chris Saunders, South Dakota state university

Panelists:

* Danica Ommen, South Dakota State University
* Hari Iyer, National Institute of Standards and Technology
* Marjan Sjerps, Netherland Forensic Institute
* Hal Stern, University of California at Irvine/CSAFE

At the 2012 ENFSI meeting, Ivo Alberink and James Curran proposed an interval quantification of the value of evidence. This led to a lively discussion on the reasonableness of these intervals for the logical and coherent interpretation of forensic evidence. Geoffrey Morrison arranged for a series of short presentations on this issue at the 2015 ENFSI meeting. This resulted in a series of papers published in Law, Probability, and Risk arguing the validity of using these intervals in the formal subjective Bayesian paradigm for evidence interpretation. It appears that the two groups arguing for and against the use of intervals are talking past each other, with one group taking a frequentist stance (or the likelihood paradigm of Edwards and Royall) and the other taking a completely subjective Bayesian view. This panel will be focused on discussing the possibility of and developing a common foundation among the participants to be able to discuss what an interval estimate of the likelihood ratio actually means and its relationship to the formal value of evidence as characterized by the Bayes Factor.