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General

Biometric Fusion Demonstration System Scientific Report

M. Mak, J. Kim, and M. Thieme.

INTERNATIONAL BIOMETRIC GROUP NEW YORK NY. Mar 2004, 74p, DRDC-CR-2004-056. The original document contains color images. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

ADA436410WBH Price code: PC A05/MF A01

DRDC-Ottawa contracted International Biometric Group (IBG) to develop a biometric fusion application, utilizing three distinct fingerprint systems and one voice verification system. This application enables biometric data collection and sample matching as well as operator configuration of multi-system matching logic. The application provides sufficient data for DRDC to perform a range of quantitative analysis on the utility of biometric systems that use multiple systems within a given modality and multiple systems within multiple modalities. This document provides background information on the biometric technologies implemented within this demonstration application (fingerprint and voice verification). It describes various multimodal biometric concepts of operation for both verification and identification systems. It details the functionality accessible through the biometric fusions application. Lastly it provides an Operator manual for the application.

Characterization of Human Skin Emanations by Solid Phase Microextraction (SPME) Extraction of Volatiles and Subsequent Analysis by Gas Chromatography-Mass Spectrometry (GC-MS)

J. Akin.

Massachusetts Inst. of Tech., Cambridge. 6 May 2005, 100p. The original document contains color images. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

ADA436606WBH Price code: PC A06/MF A02

An experimental study was performed to develop and validate a collection and analysis protocol for human skin emanations. The protocol developed included the rubbing of glass beads on the palms and backs of hands for 20 minutes. The volatile headspace above samples were extracted by a solid-phase microextraction fiber which incorporated a composite coating of liquid polymer matrix and solid porous particles. This protocol provided robust and convenient signatures of human skin emanations and was applied to two experiments for validation. In one experiment, a set of twins donated samples and results suggested qualitative differences between samples of twins. The second experiment involved collections from four unrelated individuals over a period of one month. Multivariate analysis was applied to this data set and indicated a stable signature that can be ascribed to the individual, confirming that the protocol developed here can be extended to larger sample sets of MHC typed individuals.

Biomedical Instrumentation & Bioengineering

— *Proceedings, Symposia, Etc.* —

Identifying Barriers to the Success of a Reporting System

M. L. Harper, and R. L. Helmreich.

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY ROCKVILLE MD. 2005, 14p. Pub. in *Advances in Patient Safety*, v3 p168-179, 2005. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS



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Prepared by the National Technical Information Service

U.S. Department of Commerce, Technology Administration, Springfield, VA 22161 (703) 605-6000

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ADA436532WBH Price code: PC A03/MF A01

Spurred by a controversial report from the Institute of Medicine on the prevalence of medical error, To Err Is Human, the medical profession has seen an increase in event reporting systems at the international, national, and institutional levels. Aviation, with its long history of reporting systems, has shown that these systems can yield previously unknown, but safety-critical information for developing a proactive approach to managing human error. Despite many similarities between health care and aviation, event reporting systems have not been well received in health care. Studies have shown that many physicians are reluctant to participate in programs to report medical errors, and that underreporting of adverse events may be as high as 96 percent. These findings suggest that the success of a reporting system is determined by the attitudes and perceptions of frontline care providers. Therefore, prior to implementing an event reporting system, an assessment of the opinions of care providers should be conducted to identify critical barriers to reporting. The University of Texas Human Factors Research Project has developed a survey instrument designed to assess a wide array of attitudes deemed relevant to the implementation of reporting systems. This paper summarizes preliminary survey findings and recommendations for successful implementation of an event reporting system.

Use of (1) Sensors and (2) Radio Frequency ID (RFID) for the National Children's Study. Final Report

R. Kwok.

RTI International, Research Triangle Park, NC. 25 Aug 2004, 90p, EPA/600/R-05/018. Sponsored by Environmental Protection Agency, Research Triangle Park, NC. National Center for Environmental Assessment. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

PB2005-110252WBH Price code: PC A06

This report was prepared by RTI International for the U.S. Environmental Protection Agency (EPA) under Contract No. 68-D-02-069 as a deliverable under a work assignment to prepare issue papers examining the use of (1) sensors and (2) radio frequency ID (RFID) technology. This report identifies devices using these types of technologies and offers a preliminary assessment of the utility of these devices and their needs for development for future uses in the National Children's Study in four primary areas: measurement and analysis of health/medical characteristics; measurement and analysis of exposure; collection of questionnaire data; and networking of these devices. These technological areas were identified during the Workshop on Innovative Technologies for Remote Data Collection of Data for the National Children's Study in May 2003 as the most promising in terms of utility in support of the data collection efforts of the National Children's Study.

—Proceedings, Symposia, Etc.—

Workshop. Tecnologi Microarray in Oncologia Clinica: Potenziale e Prospettive. Istituto Superiore di Sanita.

Roma 30 Guigno 2005. Riassunti (Workshop.

Microarray Technologies in Clinical Oncology: Potential and Perspectives. Istituto Superiore di Sanita. Rome, June 30, 2005. Abstract Book)

L. Gabriele, F. Moretti, and F. Belardelli.

Istituto Superiore di Sanita, Roma (Italy). Lab. di Biologia Cellulare. c2005, 34p, ISTISAN-C-05/C6. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

PB2005-109536WBH Price code: PC A04/MF A01

The workshop gives special attention to the recent applications and challenges of DNA microarray technology in clinical oncology research. Microarray technology represents a powerful tool which has potentially an enormous impact on biomedical sciences and has significantly changed the way questions about diseases are addressed. DNA microarrays have yielded new insights into basic mechanisms of cancer. The current challenge to the scientific community is to carry these new insights further and to translate these into new diagnostic, prognostic and therapeutic applications in the field of clinical oncology. The major aims of the workshop are: (i) to illustrate the diagnostic and prognostic value of microarray technology in clinical oncology; (ii) to evaluate the application of microarrays for monitoring and predicting responses of cancer patients in clinical trials. Furthermore, special attention will be dedicated to discuss technological critical issues and prospects of implementation.

Bionics & Artificial Intelligence

FMRI for Functional Localization and Task Difficulty Assessment During Visual Search for Military Vehicles

T. Meitzler, D. Bryk, E. Sohn, and J. Hirsch.

Army Tank-Automotive Command, Warren, MI. 3 Aug 2005, 13p, TACOM-15099. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

ADA436478WBH Price code: PC A03/MF A01

Past and current U.S. Army computational vision models designed to determine the difficulty of visual detection of camouflage for military vehicles are extremely limited in the sense that they do not encompass much of the brain outside the retina and visual cortex, and within those areas, do so to a very limited degree. A method and preliminary experiments to obtain the raw data to construct better and more representative models of human vision and cognition is presented. The inclusion of specific neurocircuitry in the computational model as opposed to the 'black box' standard used in psychophysics is now possible. The combination of psychophysics and fMRI has the potential to give a more complete view of the neural systems that are relied on for different perception tasks related to camouflage and deception.

Human Factors Engineering

Dismal: A Spreadsheet for Sequential Data Analysis and HCI Experimentation

F. E. Ritter, and A. B. Wood.

PENNSYLVANIA STATE UNIV UNIVERSITY PARK SCHOOL OF INFORMATION SCIENCES AND

TECHNOLOGY. 24 Jan 2002, 19p, ACS-2002-1. The

original document contains color images. Sponsored in part by

the Avionics Laboratory, Wright Research and Development Center, Wright-Patterson AFB, OH. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

ADA436412WBH Price code: PC A03/MF A01

Dismal is a spreadsheet that works within the GNU Emacs editor, a widely available programmable editor. Dismal has three particular features of interest to those interested in studying behavior: (a) the ability to manipulate and align sequential data, (b) an open architecture that allows users to expand it to meet their particular needs, and (c) an instrumented and accessible interface for studies of human-computer interaction (HCI). Example uses of these capabilities are provided including two cognitive models that have had their behavior aligned with protocols, extensions useful for teaching and doing HCI design, and studies using keystroke logs from the timing package in Dismal. Dismal is distributed with the help of the Free Software Foundation.

Index of Government Standards on Human Engineering Design Criteria, Processes, and Procedures. Version 1

A. Poston.

DEPARTMENT OF DEFENSE HUMAN FACTORS ENGINEERING TECHNICAL ADVISORY GROUP RESTON VA. 1 Nov 2004, 20p. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

ADA436638WBH Price code: PC A03/MF A01

The Index is a reference list of Human Systems/Human Engineering standardization documents. Documents clearly identified as standards are included in the list, some standards-like documents may also be included. Some are titled as guides, preferred practices, or similar; however, they are written in the manner of standards, i.e., they contain provisions with traditional action verbs (shall/should/may) and bear a standard identifier number. The focus of this Index is U.S. government standards (though Appendix A contains a listing of British Defense Standards), and is also limited to documents designated by numbered identifiers.

Index of Non-Government Standards on Human Engineering Design Criteria and Program Requirements/Guidelines. Version 3

A. Poston.

DEPARTMENT OF DEFENSE HUMAN FACTORS ENGINEERING TECHNICAL ADVISORY GROUP RESTON VA. 1 Oct 2002, 43p. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

ADA436635WBH Price code: PC A04/MF A01

The Index is a reference list of non-government Human Systems/Human Engineering standardization documents. Since the designation of documents as standards by non-government standards bodies tends to be somewhat flexible, the scope of non-government standards for the Index was kept quite loose

and includes standards, specifications, recommended practices, codes, guides, handbooks, etc. The Index also lists draft standards, standardization organizations, and where to obtain the documents.

Inferring Rule-Based Strategies in Dynamic Judgment Tasks: Towards a Noncompensatory Formulation of the Lens Model

L. Rothrock, and A. Kirlik.

Illinois Univ. at Urbana-Champaign, Savoy. Inst. of Aviation. Feb 2003, 34p, AHFD-03-5/NTSC-03-1. Prepared in cooperation with Pennsylvania State University. Product reproduced from digital image. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

ADA436779WBH Price code: PC A04/MF A01

Performers in time-stressed, information-rich tasks develop rule-based, simplification strategies to cope with the severe cognitive demands imposed by judgment and decision making. Linear regression modeling, proven useful for describing judgment in a wide range of static tasks, may provide misleading accounts of these heuristics. That approach assumes cue-weighting and cue-integration are well described by compensatory strategies. In contrast, evidence suggests that heuristic strategies in dynamic tasks may instead reflect rule-based, noncompensatory cue usage. We therefore present a technique, called Genetics-Based Policy Capturing (GBPC), for inferring noncompensatory, rule-based heuristics from judgment data, as an alternative to regression. In GBPC, rule-base representation and search uses a genetic algorithm, and fitting the model to data uses multi-objective optimization to maximize fit on three dimensions: (a) completeness (all human judgments are represented); (b) specificity (maximal concreteness); and (c) parsimony (no unnecessary rules are used). GBPC is illustrated using data from the highest and lowest scoring participants in a simulated dynamic, combat information center (CIC) task. GBPC inferred rule-bases for these two performers that shed light on both skill and error. We compare the GBPC results with regression-based Lens Modeling of the same data set, and discuss how the GBPC results allowed us to interpret the high scoring performer's highly significant use of unmodeled knowledge ($C=1$) revealed by Lens Model analysis. The GBPC findings also allow us to now interpret a similarly high use of unmodeled knowledge ($C=1$) in a previously published Lens Model analysis of a different data set collected in the same experimental task.

Soluciones Simples: Ergonomia para Trabajadores Agrícolas. (Simple Solutions: Ergonomics for Farm Workers.)

S. Baron, C. F. Estill, A. Steege, and N. Lalich.

National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Surveillance, Hazard Evaluations and Field Studies. Feb 2001, 58p, DHHS/PUB/NIOSH-2001-111-SPA. Text in Spanish. For english version, see PB2001-103911. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

PB2005-109916WBH Price code: PC A05/MF A01

Farm work is hard work, and farm workers feel the results. Farm workers get backaches and pains in the shoulders, arms,

and hands more than any other health problem. A third of the injuries that cause them to miss work are sprains and strains, and a quarter are back injuries. These are also the most common causes of disability. This pamphlet is about early intervention to prevent such injuries. It is directed toward growers, safety specialists, human resources managers-- anyone with an interest in having safe farms.

**Systems Perspective on Situation Awareness II:
Experimental Evaluation of a Modeling and Measurement
Technique**

R. Strauss, and A. Kirlik.
Illinois Univ. at Urbana-Champaign, Savoy. Inst. of Aviation.
May 2003, 23p, AFHD-03-13/NTSC-03-3. Prepared in
cooperation with FatWire Software. The original document
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ADA436780WBH Price code: PC A03/MF A01

We present an empirical evaluation of the utility of a systems perspective on measuring and modeling Situation Awareness (SA) in a laboratory simulation requiring submarine stealth judgments to be made in an uncertain task environment. Applying the model to a comparison of baseline versus perceptually augmented interface conditions revealed that augmentation had both positive and negative effects on SA (improving the consistency with which humans perceptually acquired information, while also increasing regression bias, suggesting that supporting reliable cue perception was accompanied by overly severe assessments made on the basis of these cues). The model was also used as the basis for a post-hoc diagnosis of the factors discriminating high and low performers. These factors were both the consistency of cue perception and the ability to consistently apply task knowledge, rather than the task knowledge per se. These findings help to verify the utility of a systems-oriented approach to measuring and modeling SA in interface-mediated, uncertain environments.

— **Foreign Technology** —

**Tjaenster foer Samverkande Pittformsoperatoerer
(Services for Platform Cooperating Operators)**

D. Stroemberg, and F. Lantz.
Swedish Defence Research Agency, Linkoeping. Command and
Control Systems. Dec 2004, 48p, FOI-R-1472-SE. Text in
Swedish; summary in English. Order this product from NTIS
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(703)605-6000 (other countries); fax at (703)605-6900;
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Royal Road, Springfield, VA, 22161, USA.

PB2005-107448WBH Price code: PC A04/MF A01

This report is about services for cooperating platform operators. In the introduction, an interpretation and systematic penetration of the service concept is made. Then important operator requirements are presented. Resource management, sensor control and knowledge technology for cooperating agents are introduced, described and evaluated with regard to the operator requirements. The services often require that sensors can be used, and methods for sensor management are described in two appendices. Furthermore, the services might be viewed as distributed intelligent programs, and the agent technology is introduced as a knowledge technology supporting distributed decision making in networks. It might be used as a tool for cooperation in

networks, and some military applications are described. An approach to agent-based theory for management of sensors in networks is presented.

Towards a Trial Plan for Evaluating the COMDAT TD

M. L. Matthews, and A. R. Keeble.
HUMANSYSTEMS INC GUELPH (ONTARIO), 31 Mar
2004, 36p, DRDC-TORONTO-CR-2004-053. Product
reproduced from digital image. Order this product from NTIS
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ADA436408WBH Price code: PC A04/MF A01

This report outlines a series of evaluations and analyses of the COMDAT TD with a view to conducting future trials to evaluate its potential impact upon operator performance in the Operations Room of the Halifax Class frigate. Specific issues commented upon include the operator-machine interface, the logistics of integrating the TD into a suitable trial environment, the availability of existing scenario elements to provide a suitable evaluation context, the types of performance measures that could be feasibly implemented and options for the format and location of future trials.

Protective Equipment

**Supplement I: Status Report to the Attorney General on
Body Armor Safety Initiative Testing and Activities**

National Inst. of Justice, Washington, DC. Office of Justice
Programs. 27 Dec 2004, 20p, NCJ-207605. Product
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PB2005-109645WBH Price code: PC A03/MF A01

On November 17, 2003, Attorney General John Ashcroft announced the Department of Justice's Body Armor Safety Initiative in response to concerns from the law enforcement community regarding the effectiveness of their armor. He directed the National Institute of Justice (NIJ) to initiate an examination of Zylon-based bullet-resistant armor (both new and used), to analyze upgrade kits provided by manufacturers to retrofit Zylon-based bullet-resistant armors, and to review the existing process by which bullet-resistant armor is certified to determine if the process needs modification. On March 11, 2004, as part of the Attorney General's directive, the Office of Justice Programs (OJP) held a Body Armor Summit. Summit participants included representatives of Federal, State, and local law enforcement agencies and associations; manufacturers of bullet-resistant fiber, fabric, and armor; and standards and testing organizations. They provided guidance to OJP on the future of body armor research and development, standards and testing, and also reviewed information about NIJ's preliminary evaluation of Zylon-based armor.

Early Cold War Overflights – Memoirs of 1950-1956 Aviators

Two-volume set from historical symposium now available from the NTIS

Learn about the early reconnaissance efforts over the “denied territories” of the Soviet Union and China between 1950 and 1956 from the men who flew those missions. *Early Cold War Overflights* shows how they helped keep the Cold War ‘cold’ and usher in a revolution in intelligence gathering that opened the world to American scrutiny. The Proceedings from the Early Cold War Overflights Symposium, held in Washington, D.C. in February 2001, is now available from the National Technical Information Service in a two-volume set.

Organized by public historians from the Intelligence Community and Department of Defense, the symposium’s purpose was two-fold:

- Shed light on an important, often misrepresented and little known aspect of the Cold War
- Recognize the veterans of these operations and collect their memoirs for the historic record

Volume 1 addresses the United States and British overflight efforts conducted through the end of 1956. These years bracket the least known and most poorly understood era of the Cold War. The accounts add significantly to the history of peacetime strategic reconnaissance. Their highly classified overflight missions involved incredible dangers and considerable hardships. In executing them successfully, they furnished critical intelligence during one of the darkest periods of the Cold War.

The appendixes in Volume 2 provide the biographies of contributors, aircraft characteristics, selected readings, and the historical background of overflights in Asia. It also includes over 150 pages of once classified overflight documents.

Early Cold War Overflights Symposium Proceedings is available from NTIS, call 1-800-553-6847 or (703) 605-6000, for \$98 plus \$5 handling fee, no additional charge for shipping; quote order number PB2003-928004KSR. Most major credit cards accepted. Fax orders to (703) 605-6900. Order online at <http://www.ntis.gov/products/coldwar.asp>.

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A09	\$ 95.00	\$ 119.00	E09	\$ 102.00
A10	\$ 102.00	\$ 127.50	E10	\$ 111.00
A11	\$ 109.00	\$ 136.50	E11	\$ 120.00
A12	\$ 118.00	\$ 147.50	E12	\$ 132.00
A13	\$ 125.00	\$ 156.50	E13	\$ 141.00
A14	\$ 129.00	\$ 161.50	E14	\$ 152.00
A15	\$ 134.00	\$ 167.50	E15	\$ 164.00
A16	\$ 138.00	\$ 172.50	E16	\$ 180.00
A17	\$ 143.00	\$ 179.00	E17	\$ 196.00
A18	\$ 151.00	\$ 189.00	E18	\$ 210.00
A19	\$ 156.00	\$ 195.00	E19	\$ 233.00
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