

一、 研究团队

国际:

A. CITeR (Center for Identification Technology Research)

<http://www.citer.wvu.edu/>

I. Introduction:

CITeR 是美国自然科学基金工业/大学合作研究中心成立的第一个实验室，致力于研究飞速发展的生物特征识别技术，为政府机构和企业提供服务。

它的成员机构包括:

Digimarc	http://www.digimarc.com/
DoD Biometrics	http://www.biometrics.dod.mil/
FBI	http://www.fbi.gov/
Gaiker	http://www.gaiker.es/english/index.asp
Man Tech e-IC, Inc.	http://www.mantech.com/eic/
National Security Agency	http://www.nsa.gov/
Transportation Security Administration	http://www.tsa.gov/public/index.jsp
United States Special Operations Command	http://www.socom.mil/

学术伙伴来自

West Virginia University
Michigan State University
Clarkson University
St. Lawrence University
University of Pittsburgh

II. Research Areas:

1. Biometric Image / Signal Processing and Pattern Recognition
2. Biometric Sensing and Analysis
3. Biometric System Statistical Design and Evaluation
4. Biometrics in Information Assurance
5. Business and Economic Issues
6. Legal and Policy Issues

II. Research portfolio:

(from “Edwin P. Rood, ‘A Biometric Research Agenda and the Course of Biometrics Research’, invited lecture on ICBA 2004, Hong Kong, China, July 2004”)

- ◆ Technologies – Single Mode

1. *Acquisition and Understanding of Nonideal Iris Imagery*
L. Hornak, X. Li, G. Fahmy N. Schmidt, LDCSEE WVU, S. Schuckers,
Clarkson/WVU, ; A Realini, WVU Eye Center.
 2. *Geometric Coding of Biometric Images*
X. Li (WVU).
 3. *Solidifying CITEr's Liveness Core Competency*
S. Schuckers (Clarkson/WVU), L. A. Hornak (WVU) and T. Norman (Orthopedics
WVU).
- ◆ **Technologies – Multimodal**
 1. *Multibiometric Score Normalization*
A. Ross (WVU) and A. Jain (Michigan State University).
 2. *Multibiometric Fusion at the Feature Extraction Level and Face Indexing*
A. Ross and N. Schmid, LDCSEE, WVU.
 3. *Multimodal Biometric Systems: Phase II*
A. Jain (Michigan State University).
 - ◆ **Measures of Performance**
 1. *A Study of Various Methodologies for Error Estimation in Biometric Systems*
M. Schuckers (St. Lawrence University)
 2. *Statistical Basis of Multimodal Systems*
B. Cukic and R. Singh (WVU).
 3. *Developing the PRESS - Methodologies for Estimating Error Rates of Biometric
Devices*
M. Schuckers, St. Lawrence University
 - ◆ **Societal Implications**
 1. *Socio-Legal Assessment Study*
L. Nelson (University of Pittsburgh).
 - ◆ **Economics and Workforce**
 2. *Biometrics Business Case Study*
V. Kleist and R. Riley (Business and Economics WVU).
 3. *Strategic Business Directions in Biometrics: Research with Vendors, Government
and Corporate Buyers*
V. Kleist, R. Riley, Dept. of Management and MIS, WVU

B. Biometrics Research Program, Michigan State University, USA

<http://biometrics.cse.msu.edu/index.html>

I. People:

Anil K. Jain, MSU

George C. Stockman, MSU

Sarat C. Dass, MSU

II. Research Area and Publication:

◆ **Multibiometrics**

1. A. Ross and A. K. Jain, "[Information Fusion in Biometrics](#)", *Pattern Recognition Letters, Special Issue in Multimodal Biometrics*, Vol. 24, Issue 13, pp. 2115-2125, September, 2003.
2. Y. Wang, T. Tan and A. K. Jain, "[Combining Face and Iris Biometrics for Identity Verification](#)", *Proc. of 4th Int'l Conf. on Audio- and Video-Based Biometric Person Authentication (AVBPA)*, pp. 805-813, Guildford, UK, June 9-11, 2003.
3. A. Kumar, D. C. M. Wong, H. C. Shen and A. K. Jain, "[Personal Verification Using Palmprint and Hand Geometry Biometric](#)", *Proc. of 4th Int'l Conf. on Audio- and Video-Based Biometric Person Authentication (AVBPA)*, pp. 668-678, Guildford, UK, June 9-11, 2003.
4. A. K. Jain and A. Ross, "[Learning User-specific Parameters in a Multibiometric System](#)", *Proc. International Conference on Image Processing (ICIP)*, Rochester, New York, September 22-25, 2002.
5. A. Ross, A. K. Jain, and Jian Zhong Qian, "[Information Fusion in Biometrics](#)", *Proc. 3rd International Conference on Audio- and Video-Based Person Authentication*, Sweden, June 6-8, 2001.
6. Lin Hong, Anil Jain and Sharath Pankanti, "[Can Multibiometrics Improve performance?](#)", *Proceedings AutoID'99*, Summit, NJ, Oct 1999, PP. 59-64.

◆ **Fingerprint Mosaicking**

1. A. K. Jain and A. Ross, "[Fingerprint Mosaicking](#)", *Proc. International Conference on Acoustic Speech and Signal Processing (ICASSP)*, Orlando, Florida, May 13-17, 2002.

◆ **Hybrid Fingerprint Matcher**

1. A. Ross, A. K. Jain, and J. Reisman, "[A Hybrid Fingerprint Matcher](#)", *Pattern Recognition*, Vol. 36, No. 7, pp. 1661-1673, 2003.
2. A. Ross, J. Reisman and A. K. Jain, "[Fingerprint Matching Using Feature Space Correlation](#)", *Proc. of Post-ECCV Workshop on Biometric Authentication*, Copenhagen, Denmark, June 1, 2002.
3. A. K. Jain, A. Ross, and S. Prabhakar, "[Fingerprint Matching Using Minutiae and Texture Features](#)", *Proc. International Conference on Image Processing (ICIP)*, Greece, October 7-10, 2001.
4. A. K. Jain, S. Prabhakar, L. Hong and S. Pankanti [Filterbank-based Fingerprint Matching](#), *IEEE Transactions on Image Processing*, Vol. 9, No.5, pp. 846-859, May 2000.

◆ **Biometric Template Selection and Update:**

1. U. Uludag, A. Ross and A. K. Jain, "[Biometric Template Selection and Update: A Case Study in Fingerprints](#)", *Pattern Recognition*, Vol. 37, No. 7, pp. 1533-1542, July 2004.
2. A. K. Jain, U. Uludag and A. Ross, "[Biometric Template Selection: A Case Study in Fingerprints](#)", *Proc. of 4th Int'l Conf. on Audio- and Video-Based Biometric Person Authentication (AVBPA)*, pp. 335-342, Guildford, UK, June 9-11, 2003.

◆ **Fingerprint Watermarking:**

1. A. K. Jain and U. Uludag, "Hiding biometric data," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 25, no. 11, pp. 1494-1498, November 2003.
2. A. K. Jain, U. Uludag and R. L. Hsu, "[Hiding a face in a fingerprint image](#)", *Proc. International Conference on Pattern Recognition (ICPR)*, Canada, August 11-15, 2002.
3. A. K. Jain and U. Uludag, "[Hiding fingerprint minutiae in images](#)", *Proc. Automatic*

Identification Advanced Technologies (AutoID), pp. 97-102, New York, March 14-15, 2002.

◆ **Dental Biometrics:**

1. H. Chen and A. K. Jain, "[Tooth Contour Extraction for Matching Dental Radiographs](#)", *Proc. ICPR 2004*, vol. III, pp. 522-525, Cambridge, UK, August 2004.
2. G. Fahmy, D. Nassar, E. Haj-Said, H. Chen, O. Nomir, J. Zhou, R. Howell, H. H. Ammar, M. Abdel-Mottaleb and A. K. Jain, "[Towards an Automated Dental Identification System \(ADIS\)](#)", *Proceedings of the International Conference on Biometric Authentication (ICBA)*, Hong Kong, July 2004.
3. A. K. Jain and H. Chen, "[Matching of Dental X-ray Images for Human Identification](#)", *Pattern Recognition*, Vol. 37, No. 7, pp. 1519-1532, July 2004.
4. A. K. Jain, H. Chen and S. Minut, "[Dental Biometrics: Human Identification Using Dental Radiographs](#)", *Proc. of 4th Int'l Conf. on Audio- and Video-Based Biometric Person Authentication (AVBPA)*, pp. 429-437, Guildford, UK, June 9-11, 2003.

◆ **Signature Verification:**

1. A.K. Jain, Friederike D. Griess and Scott D. Connell, "[On-line Signature Verification](#)", *Pattern Recognition*, vol. 35, no. 12, pp. 2963--2972, Dec 2002.
2. Friederike D. Griess and Anil K. Jain, "[On-line Signature Verification](#)", MSU Technical Report TR00-15, 2000.

◆ **Fingerprint Classification:**

1. S. Dass, "Fingerprint Classification Using Orientation Field Flow Curves", *To appear in Proc. ICVGIP 2004*, Kolkata, India, December 16-18, 2004.
2. A. K. Jain and S. Minut, "[Hierarchical Kernel Fitting for Fingerprint Classification and Alignment](#)", *Proc. of International Conference on Pattern Recognition*, Quebec City, August 11-15, 2002.
3. A. K. Jain, S. Prabhakar and L. Hong, "[A Multichannel Approach to Fingerprint Classification](#)", *IEEE Transactions on PAMI*, Vol.21, No.4, pp. 348-359, April 1999.

◆ **Distinguishing Identical Twins Using Fingerprints**

1. A. K. Jain, S. Prabhakar, and S. Pankanti, "[On The Similarity of Identical Twin Fingerprints](#)", *Pattern Recognition*, Vol. 35, No. 11, pp. 2653-2663, 2002.

◆ **Individuality of Fingerprints**

1. S. Pankanti, S. Prabhakar, and A. K. Jain, "[On the Individuality of Fingerprints](#)", *IEEE Transactions on PAMI*, Vol. 24, No. 8, pp. 1010-1025, 2002. A shorter version also appears in *Fingerprint Whorld*, pp. 150-159, July 2002.

◆ **Combination of Fingerprint Matchers**

1. A. K. Jain, S. Prabhakar and S. Chen, "[Combining Multiple Matchers for a High Security Fingerprint Verification System](#)", *Pattern Recognition Letters*, Vol 20, No. 11-13, pp. 1371-1379, 1999.
2. S. Prabhakar and A. K. Jain, "[Decision-level Fusion in Fingerprint Verification](#)" *Pattern Recognition*, Vol. 35, No. 4, pp. 861-874, 2002.

◆ **Face Detection:**

1. R.-L. Hsu, Mohamed Abdel-Mottaleb and A. K. Jain, "[Face Detection in Color Images](#)", *IEEE Transactions on PAMI*, vol. 24, no.5, pp. 696-706, May 2002.
2. R.-L. Hsu, M. Abdel-Mottaleb, and A. K. Jain, "[Face detection in color images](#)", *Proc. International Conference on Image Processing (ICIP)*, Greece, October 7-10, 2001.

3. Sarat C. Dass and A. K. Jain, "[Markov Face Models](#)", *The Eighth IEEE International Conference on Computer Vision (ICCV)*, Vancouver, Canada, July 9-12, 2001.

◆ **Face Modeling:**

1. R.-L. Hsu and A. K. Jain, "[Semantic face matching](#)", *Proc. IEEE Int'l Conf. Multimedia and Expo (ICME)*, Lausanne, Switzerland, Aug. 2002.
2. R.-L. Hsu and A. K. Jain, "[Face modeling for recognition](#)", *Proc. International Conference on Image Processing (ICIP)*, Greece, October 7-10, 2001.

◆ **3D Face Recognition:**

1. X. Lu and A.K. Jain, "[Integrating range and texture information for 3D face recognition](#)", *Proc. of WACV (Workshop on Applications of Computer Vision)*, pp. 156-163, Breckenridge, Colorado, January 2005.
2. X. Lu and A.K. Jain, "[Deformation Analysis for 3D Face Matching](#)", *Proc. of WACV (Workshop on Applications of Computer Vision)*, pp. 99-104, Breckenridge, Colorado, January 2005.
3. X. Lu, D. Colbry and A. K. Jain, "[Three-Dimensional Model Based Face Recognition](#)", *Proc. International Conference on Pattern Recognition (ICPR)*, vol. I, pp. 362-366, Cambridge, UK, August 2004.
4. X. Lu, D. Colbry and A. K. Jain, "[Matching 2.5D Scans for Face Recognition](#)", *Proc. International Conference on Biometric Authentication (ICBA)*, pp. 30-36, Hong Kong, July 2004.
5. X. Lu, R. Hsu, A. Jain, B. Kamgar-Parsi and B. Kamgar-Parsi, "[Face Recognition with 3D Model-Based Synthesis](#)", *Proc. International Conference on Biometric Authentication (ICBA)*, pp. 139-146, Hong Kong, July 2004.

◆ **Combination of Face Matchers:**

1. X. Lu, Y. Wang and A. K. Jain, "[Combining Classifiers for Face Recognition](#)", *Proc. ICME 2003, IEEE International Conference on Multimedia & Expo*, vol. III, pp. 13-16, Baltimore, MD, July 6-9, 2003.

◆ **Biometrics-based Multimedia Content Protection**

1. U. Uludag and A. K. Jain, "[Multimedia Content Protection via Biometrics-based Encryption](#)", *Proc. ICME 2003, IEEE International Conference on Multimedia & Expo*, vol. III, pp. 237-240, Baltimore, MD, July 6-9, 2003.

◆ **Attacks on Biometric Systems**

1. U. Uludag and A.K. Jain, "[Attacks on biometric systems: a case study in fingerprints](#)", *Proc. SPIE-EI 2004*, pp. 622-633, San Jose, CA, January 18-22, 2004.

◆ **Soft Biometrics**

1. A. K. Jain, S. C. Dass and K. Nandakumar, "[Soft Biometric Traits for Personal Recognition Systems](#)", *Proc. International Conference on Biometric Authentication (ICBA)*, pp. 731-738, Hong Kong, July 2004.
2. A. K. Jain, S. C. Dass and K. Nandakumar, "[Can soft biometric traits assist user recognition?](#)", *Proceedings of SPIE Defense and Security Symposium*, Orlando, FL, April 2004.

C. Biomedical Signal Analysis Laboratory, Clarkson University, USA

<http://people.clarkson.edu/~biosal/index.html>

I. People:

Director: Dr. Stephanie Schuckers
Associated Faculty: Dr. Lawrence Hornak, WVU, LCSEE
Dr. Arun Ross, WVU, LCSEE
Dr. Sherman Riemenschneider, WVU, Math
Dr. Edward Sazonov, Clarkson
Dr. Alireza Ziarani, Clarkson
Dr. Sunil Kumar, Clarkson

II. Research Area:

◆ Liveness detection in biometric devices

1. Determination of fingerprint vitality
2. Determination of iris recognition system flaws and factors used for liveness detection
3. Perspiration for Detecting Liveness in Fingerprint Scanners—Comparison of Different Classifiers
4. Spoofing and Liveness Detection - Brief Background
5. Spoofing Fingerprint Devices
6. Combining Lip Movement with Speech, Voice, and Facial for Identification

◆ Other biometric research

1. Non-Ideal Iris Recognition Imagery
2. Development of a web-based, multibiometric database
3. Biologically Inspired Temporal Evolutionary Neural Circuits

III. Publication:

1. Schuckers SAC, Derakhshani R, Parthasaradhi S, Hornak LA, Liveness Detection in Biometric Devices, in Electrical Engineering Handbook, 3rd edition, CRC Press, to be published, 2005.
2. Parthasaradhi S, Derakhshani R, Hornak L, Schuckers SAC, Time-Series Detection of Perspiration as a Liveness Test in Fingerprint Devices, IEEE Transactions on Systems, Man, and Cybernetics, Part C: Applications and Reviews, accepted for publication.
3. Sazonov E, Sazonova N, Schuckers SAC, Neuman M, and CHIME Study Group, Activity-based sleep-wake identification in infants, *Physiol. Meas.*, vol. 25 pp. 1291-1304, 2004. Chosen by editors as “IoP Select” article.
4. Schuckers SAC, Parthasaradhi S, Derakhshani R, Hornak L, Comparison of classification methods for time-series detection of perspiration as a liveness test in fingerprint devices, *Biometric Authentication: First International Conference (ICBA)*, LNCS 3072, Springer, Hong Kong, July 2004.

5. Schuckers SAC, Abhyankar A, A Wavelet Based Approach to Detecting Liveness in Fingerprint Scanners, Proceedings of the Biometric Authentication Workshop, ECCV, Prague, May, 2004.
6. Schuckers SAC, Derakhshani R, Parthasaradhi S, Hornak L, Improvement of an algorithm for recognition of liveness using perspiration in fingerprint devices, Proceedings of the SPIE Defense and Security Symposium, Biometric Technology for Human Identification, Orlando, April, 2004.
7. Schuckers SA, Abhyankar A, Wavelet-based approach to detecting liveness in fingerprint scanners, Proceedings of the SPIE Defense and Security Symposium, Biometric Technology for Human Identification, Orlando, April, 2004.
8. Derakhshani R, Schuckers SAC, Determination of Vitality From A Non-Invasive Biomedical Measurement for Use in Fingerprint Scanners, Pattern Recognition, No.2 pp. 383-396, 2003.
9. Raphisak P, Curry AD, Malkin RA, Schuckers SAC, Heart Rate Variability in Rats with Aldosterone-Induced Chronic Heart Failure, IEEE Engineering Medicine and Biology Society Annual Conference Proceedings, September 2003.
10. Raphisak P, Schuckers SAC, Analysis of Heart Rate Variability in a Rabbit Model of Heart Failure Using Karhunen-Loeve Expansion, Proceedings of the Northeast Bioengineering Conference, Newark, NJ, March 22-23, 2003.

D. SABER (Statistical Analysis of Biometric Error Rates) Project, St. Lawrence University, USA

<http://it.stlawu.edu/~msch/biometrics/>

I. People:

Michael E. Schuckers, Ph.D.

II. Project:

1. Estimation of confidence intervals for biometric error rates
2. Sample size calculations for biometrics error rates
3. Evaluating biometric error rates when zero errors are observed

III. Publication:

1. M.E.Schuckers, A.M.Hawley, T.N.Mramba, K.A.Livingstone and C.J.Knickerbocker, "A comparison of statistical methods for evaluating matching performance of a biometric identification device- a preliminary report", Proceedings of the Biometric Technology For Human Identification Conference 2004 (to appear)
2. T.J.Atkinson and M.E.Schuckers, "Approximate confidence interval estimation for estimation of matching error rates of biometric identification devices", Submitted to Biometric Authentication Workshop'04
3. M.E.Schuckers, "Estimation and sample size calculations for correlated binary error rates

of biometric identification rates”, In 2003 Proceedings of the American Statistical Association: Biometrics Section, American Statistical Association, Alexandria, VA
M.E.Schuckers , “Using the Beta-binomial distribution to assess performance of a biometric identification device”, International Journal of Image and Graphics, vol. 3, no. 3, July 2003

IV. Software

Program for Rate Estimation and Statistical Summaries

<http://it.stlawu.edu/~msch/biometrics/downloads.htm>

E. Computer Laboratory , University of Cambridge, UK

<http://www.cl.cam.ac.uk/users/jgd1000/>

I. People:

John Daugman, CAM

II. Research Area:

1. Anti-spoofing ("liveness detection")
2. Improved user interfaces
3. Extracting stable cryptographic keys from IrisCodes

III. Publication:

1. John Daugman: Recognising Persons by Their Iris Patterns. SINOBIO METRICS 2004: 5-25
2. John Daugman: How iris recognition works. IEEE Trans. Circuits Syst. Video Techn. 14(1): 21-30 (2004)

F. Biometric Systems Lab, University of Bologna, Italy

http://bias.csr.unibo.it/research/biolab/bio_tree.html

I. People:

Dario Maio, Director

Davide Maltoni, *Vice-Director*

Raffaele Cappelli

Matteo Golfarelli

Alessandra Lumini

Visitors:

Ali Erol ,NNCVIS-Middle East Technical University, Ankara-Turkey

Julian Fierrez-Aguilar, Biometrics Research Lab, Universidad Autonoma de Madrid, Spain

Almudena Lindoso, Universidad Carlos III, Madrid - Spain

II. Research Area:

1. fingerprint
2. face
3. hand
4. performance evaluation
5. Multimodal
6. Biometric Encryption

III. Publication:

1. A. Antonelli, R. Cappelli, D. Maio and D. Maltoni, "A new approach to fake finger detection based on skin distortion", in proceedings **International Conference on Biometric Authentication (ICBA06)**, Hong Kong, January 2006.
2. D. Baldisserra, A. Franco, D. Maio and D. Maltoni, "Fake Fingerprint Detection by Odor Analysis", in proceedings **International Conference on Biometric Authentication (ICBA06)**, Hong Kong, January 2006.
3. D. Baldisserra, A. Franco, D. Maio and D. Maltoni, "Apparecchio e metodo per discriminare una impronta digitale vera da una impronta digitale artificiale attraverso l'analisi dell'odore del dito associato all'impronta digitale da discriminare", Patent N. BO2005A000398, 2005.
4. A. Antonelli, R. Cappelli, D. Maio and D. Maltoni, "Apparecchio e metodo per discriminare una impronta digitale vera da una impronta digitale artificiale falsa, attraverso l'analisi della distorsione elastica della pelle", Patent N. BO2005A000399, 2005.
5. J. Fierrez-Aguilar, L. Nanni, J. Lopez-Penalba, J. Ortega-Garcia and D. Maltoni, "An On-Line Signature Verification System Based on Fusion of Local and Global Information", to appear on proceedings *Audio- and Video-based Biometric Person Authentication*, New York, July 2005.
6. J.L. Wayman, A.K. Jain, D. Maltoni and D. Maio, *Biometric Systems - Technology, Design and Performance Evaluation*, Springer, 2005.
7. D. Maio, D. Maltoni, R. Cappelli, J.L. Wayman and A.K. Jain, "Technology Evaluation of Fingerprint Verification Algorithms", in J.L. Wayman, A.K. Jain, D. Maltoni, D. Maio, *Biometric Systems - Technology, Design and Performance Evaluation*, 2005.
8. R. Cappelli, D. Maio and D. Maltoni, "An Improved Noise Model for the Generation of Synthetic Fingerprints", in proceedings *Eighth International Conference on Control, Automation, Robotics and Vision (ICARCV2004)*, Kunming, China, December 2004.
9. A. Franco, A. Lumini and D. Maio, "A Hierarchical Approach for Face Recognition", in proceedings *International Conference on Visualization, Imaging and Image Processing (VIIP04)*, Marbella, Spain, pp.54-59, September 2004.

10. R. Cappelli, A. Franco, D. Maltoni and L. Nanni, "Combining Template-based and feature-based detectors", in proceedings *International Conference on Visualization, Imaging and Image Processing (VIIP04)*, Marbella, Spain, pp.50-53, September 2004.
11. R. Cappelli, D. Maio and D. Maltoni, "Technology Evaluations of Fingerprint-Based Biometric Systems", in proceedings *12th European Signal Processing Conference (EUSIPCO2004)*, Vienna, Austria, pp.1405-1408, September 2004. Invited paper.
12. D. Maio, D. Maltoni, R. Cappelli, J.L. Wayman and A.K. Jain, "FVC2004: Third Fingerprint Verification Competition", in proceedings *International Conference on Biometric Authentication (ICBA04)*, Hong Kong, pp.1-7, July 2004.
13. R. Cappelli, "SFinGe: an Approach to Synthetic Fingerprint Generation", in proceedings *International Workshop on Biometric Technologies (BT2004)*, Calgary, Canada, pp.147-154, June 2004. Invited paper.
14. L. Nanni, A. Franco and R. Cappelli, "Towards a robust face detector", in proceedings *Biometric Authentication Workshop (BIOAW04)*, Prague (Czech Republic), pp.57-69, May 2004.
15. D. Maltoni and A.K. Jain, *Biometric Authentication (proceedings of BioAW2004)*, Springer, 2004.
16. R. Cappelli, "FVC: Fingerprint Verification Competitions", in proceedings *Second BSI-Symposium on Biometrics 2004*, Darmstadt (Germany), pp.56-63, March 2004.
17. R. Cappelli and D. Maio, "The State of the Art in Fingerprint Classification", in N. Ratha and R. Bolle, *Automatic Fingerprint Recognition Systems*, Springer, 2004.
18. D. Maltoni, "Generation of Synthetic Fingerprint Image Databases", in N. Ratha and R. Bolle, *Automatic Fingerprint Recognition Systems*, Springer, 2004.

G. Surrey University

国内:

H. 先进人机通信技术联合实验室

<http://www.jdl.ac.cn/project.asp>

I. 人员:

高文、陈熙霖等

II. 研究领域:

1. 人脸识别与确认研究
2. 人脸数据库与评测标准研究
3. 中国手语识别
4. 中国手语合成

III. 研究成果

该实验室在人脸图像预处理、人脸检测、人脸识别与确认等方面，提出了一系列新算法和改进算法，在光照可变、多姿态等条件下性能优于其他系统：在中国首届生物特征识别评测竞赛 BVC2004 中，以绝对优势取得了第一名。在 FVC2006 人脸识别国际评测竞赛中，取得全部单项第一名。

发表的论文和申请的专利具体见如下网页：<http://www.jdl.ac.cn/project/faceId/index.htm>

I. 生物特征认证与安全技术研究中心，中科院自动化所

<http://www.sinobiometrics.com/index-ch.htm>

IV. 人员：

管理团队：李子青，主任

田捷，副主任

王阳生，副主任

中心顾问：谭铁牛（研究员、博士生导师）

Anil K.Jain (Professor), Michigan State University, USA.

Josef Kittler (Professor), University of Surrey, UK.

V. 研究领域

5. 人脸识别
6. 虹膜识别
7. 指纹识别
8. 步态识别
9. 声纹识别
10. 笔迹识别
11. 多生物特征融合
12. 智能视觉监控

VI. 研究成果

申请专利

1. 谭铁牛，朱勇，王蕴红：虹膜图象采集装置，国家知识产权局专利号：L99217063.X（实用新型）
2. 谭铁牛，王蕴红，马力：活体虹膜图像采集装置，申请号：01278644.6(实用新型)，授权日：2002.08.28.
3. 谭铁牛，朱勇：基于纹理分析的字体和笔迹识别方法，申请号：99105851.8(发明)
4. 刘瑞桢，谭铁牛：一种保护多媒体文件和多媒体数据的方法，申请号：99107964.7(发明)
5. 谭铁牛，朱勇，王蕴红：基于虹膜识别的身份鉴定方法与装置，申请号：99110825.6(发明)
6. 谭铁牛，王蕴红，朱勇：基于多生物特征的身份鉴定融合方法，申请号：99126037.6(发明)

7. 谭铁牛, 王蕴红, 马力: 基于活体虹膜的身份识别方法, 申请号: 01144524.6(发明), 申请日: 2001.12.18。
8. 谭铁牛, 王亮: 基于步态的远距离身份识别方法, 申请号: 01144157.7(发明), 申请日: 2001.12.13。
9. 谭铁牛, 王蕴红, 马力, 张德馨: 基于小波变换和过零点描述的虹膜识别方法, 申请号: 02145722.0(发明), 申请日: 2002.10.09。
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2. 带脉搏监测的指纹采集仪, 实用新型, 申请号: ZL01229659.7(2001年), 申请人: 田捷, (已批)

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J. Biometric Research Center, The Hong Kong Polytechnic University

<http://www4.comp.polyu.edu.hk/~biometrics/>

I. People

ZHANG Dapeng, David

II. Research Area:

1. Palmprint
2. Iris
3. Fingerprint and Voice
4. Ear
5. Signature
6. Multimodal biometrics
7. Palm diagnosis
8. Tongue diagnosis

III. Publications:

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K. 微软亚洲研究院形象计算组

<http://research.microsoft.com/asia/group/vc/default.aspx>

I. 成员

主要负责人：汤晓鸥

II. 研究项目

1. 人脸识别技术
2. 模式识别与机器学习
3. 基于样本学习的卡通风格画像自动生成方法
4. 个性化的卡通动画生成
5. 基于样本学习的卡通风格画像自动生成方法和笔触模拟
6. 英文手写体的分析、模拟与生成
7. 人体运动分析与合成
8. 视觉建模

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<http://ocrserv.ee.tsinghua.edu.cn/>

I. 成果



1. 自主研发的 TH-ID 多模式生物特征身份认证识别系统通过专家鉴定
<http://news.tsinghua.edu.cn/new/news.php?id=10756>
2. 在英国剑桥举行的第 17 届模式识别国际会议 (ICPR2004) 上, 备受关注的国际人脸认证竞赛 (FAT2004) 上, 本研究组以全部测试指标均获第一的绝对领先优势而获得人脸认证竞赛“全面性能最佳成就奖”

二、公司及产品



A. Fingerprint


公司	产品	图片	客户
ATS http://www.accu-time.com	Biometric Cyber Series		

<p>Bioscrypt http://www.bioscrypt.com/home.htm</p>	<p>V-Station</p>		<p>U.S. Department of Homeland Security</p>
<p>DigitalPersona http://www.digitalpersona.com/</p>	<p>U.are.U Fingerprint Reader</p>		<p>Microsoft</p>
<p>Cogent Systems http://www.cogentsystems.com/</p>	<p>BioGate</p>		
<p>BIO-key http://bio-key.com/</p>	<p>Vector Segment Technology (VST)</p>	<p>Patented fingerprint identification algorithm</p>	
<p>NextgenID http://www.nextgenid.com/</p>	<p>BIOAXS 9700</p>		
<p>IR Recognition Systems http://www.handreader.com/</p>	<p>FingerKey DX</p>		<p>Scott Air Force Base, U.S; New York City Law Department; University of Georgia; San Francisco International Airport;</p>

<p>深圳爱略特 http://www.aratek.com.cn/</p>	<p>指纹鼠标、U 盘 等</p>		
<p>艾迪沃德科技公司 http://www.idepco.com/</p>	<p>700 型指纹考勤 机</p>		

B. Iris

公司	产品	图片	客户
<p>Iridian Technologies http://www.iridiantech.com/index.php</p>	<p>Proof Positive™ architecture; PrivateID® camera software; KnoWho® Authentication Server</p>		<p>JFK airport, New York; Schiphol Airport, Netherlands; Panasonic; Oki</p>
<p>Panasonic http://www.panasonic.com/business/security/biometrics_access.asp#</p>	<p>BM-ET300</p>		
<p>LG Electronics/ Iris Technology Division http://www.lgiris.com/</p>	<p>LG IrisAccess® 3000</p>		<p>London's Heathrow; New York's Kennedy; Germany's Frankfurt; Canada's Vancouver; Greece's Athens airports; Time America Inc. of Phoenix; AZ; IBM; SITA</p>

<p>Cognitec http://www.cognitec.com/</p>	<p>FaceVACE-Entry</p>		<p>Australian Customs Service; Australian Dept. of Foreign Affairs and Trade; Defence Science & Technology Organisation; Corning South-Africa; Siemens; VW-Bank;</p>
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C. Hand Geometry

公司	产品	图片	客户
<p>IR Recognition Systems http://www.handreader.com/</p>	<p>HandKey II</p>		<p>Scott Air Force Base, U.S.; New York City Law Department; University of Georgia; San Francisco International Airport; Port of Rotterdam, Prestigious, Netherlands; Wisconsin Private School, U.S.;</p>
<p>ATS http://www.accu-time.com</p>	<p>Biometric Cyber Series 2102</p>	 <p>2102</p>	

D. Multimodal Biometrics

公司	产品	图片	客户
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<p>motorola http://www.motorola.com/LMPS/RNSG/public_safety/40-70-10.shtml</p>	<p><i>Iris and Palmprint:</i> Motorola Printrak LiveScan</p>		
<p>NextgenID http://www.nextgenid.com/</p>	<p><i>Face and Fingerprint:</i> BioAxs 9800</p>		
	<p><i>Iris and Fingerprint:</i> BioAxs 9800 IR</p>		

三、 新闻

- 2006 年 2 月 Pay By Touch 和 NCR 公司日前宣布结成联盟，借助双方在硬件和软件方面雄厚实力，为需要向商户和消费者提供生物特征识别支持的全球零售商们提供单一的供应渠道。根据双方的战略联盟，凡使用 NCR 具有生物特征识别功能 POS 的零售商都能享用 Pay By Touch 的身份验证和支付服务。如此一来，购物者就能方便、安全地通过手指接触来支付货款。
<http://www.rfidworld.com.cn/news/200622182223130.htm>
- 2006 年初，迪斯尼乐园采用了这种手形几何特征识别技术来识别持有季票卡的人是否确实是其本人。
<http://www.zdnet.com.au/insight/0,39023731,39187129,00.htm>
- 2005 年 12 月美国纽约 Clarkson 大学开发出汗水特征算法，解决了长久以来，指纹识别系统活体辨识不清的问题。
<http://www.rfidworld.com.cn/news/20051231105352873.htm>

4. 2005 年 11 月“手指静脉识别技术”近日登陆中国。
<http://info.fw315.hc360.com/2005/11/03095631971.shtml>
5. 2005 年 7 月日本富士通开发出生物掌纹传感器。
<http://www.biol.com.cn/html/2005-07/152.shtml>
6. 2005 年 7 月英研究利用耳形识别身份的新方法。
<http://www.biol.com.cn/html/2005-09/151.shtml>
7. 2005 年 3 月 11 日正式在德国市场投放的大众汽车第六代帕萨特采用了极具创新意义的用于启动和锁定的指纹识别系统。
<http://www.volkswagen.com.cn/>
8. 2005 年 3 月 2 日-4 日，在东京举行的 2005 年日本安全系统展览会上，欧姆龙公司展示了其新近推出的世界首款手机用面部识别传感器（OKAO Vision Face Recognition Sensor），此传感器适用于具备拍照功能的 PDA、手机和其它移动设备。该产品可以通过面部特征识别这一功能来确认使用者的身份，从而使移动设备及其信息得到了更高的安全保障。
http://www.omron.com.cn/news/newsd_group.jsp?id=171
9. 2004 年 11 月首次在美国四个点实施的交通从业人员身份资格证（TWIC）计划，采用一套生物测定“智能卡”系统用于验证 20 万运输从业人员的身份。从业人员使用智能卡进入海港、机场、铁道、管道、货车运输和公共交通设施的安保区域。以后数月，TWIC 计划将继续推广到其他设施。
<http://www.tsa.gov/public/display?theme=68>
10. 2004 年 10 月中旬日本东京的三菱银行在 267 个柜员机上安装了指纹识别系统，银行此前已经记录了用户的指纹信息并储存在带有集成芯片的卡中，柜员机对指纹信息进行读取使用户达成交易。
<http://info.fw315.hc360.com/HTML/001/001/011/005/24659.htm>
11. 2004 年 9 月 27 日，微软在北京发布了具有指纹识别器的光学桌面套装指纹版和微软无线指纹鲨。这也是业界首次将高端指纹识别技术应用到桌面外设产品中。这两款产品使人们再也不用记忆繁赘冗长的密码，手指一触间，即可轻松完成系统所需密码或用户名的输入。
www.microsoft.com/hardware/mouseandkeyboard/productdetails.aspx?pid=034
12. 2004 年 3 月美国斯科特空军基地（Scott Air Force Base）采用美国 Recogsys 公司手形识别产品 HandKey II 进行访问控制。
<http://www.recogsys.com/news/pressreleases.htm>
13. 2004 年 1 月美国在 115 个机场合 14 个港口安装新入境装置，这些是一种自动出入境系统的组成部份。该系统全名是“美国访客和移民身份显示技术”（United States Visitor and Immigrant Status Indicator Technology，简称 US-VISIT），它要求大多数持签证来美国访问的旅客在进入美国机场和海港港口时，有两份以无墨装置扫描方式做成的指纹以及一张由移民官员拍摄的数码照片。对美国各陆地入境的程序改进措施将在 2005 和 2006 年分期进行。国土安全部负责边境与交通安全的副部长阿萨·哈钦森说：“我们将首次具有一个完整的系统能使我们用生物识别的方法来确认一位来美访客的身份；这给我们提供了巨大的、新的安全能力。”
www.dhs.gov/us-visit
14. 2004 年 1 月美国国会已经通过决议，27 个可免签进入美国的国家，必须在 2005 年 10 月 26 日前开始发放带有面部识别数据芯片的生物护照，否则这些国家的公民将失去免签证待遇，现在这一期限被延长到 2005 年 10 月 26 日。美国国务院负责理事事务的助理国务卿茅拉·哈迪指出：“我们需要时间来解决技术方面以及其他方面

的复杂问题。大多数免签证国家都无法达到美国的要求，不是他们不愿意，而主要是技术上的问题。”哈迪认为需要两年的时间才能完善这一技术，而所有国家都能在 2006 年 11 月 30 日前达到要求。《美国加强边境、安全及入境签证改革法》已经为新型护照的引入使用订立了具体的时间表。同样，欧盟也开始制定使用机读护照的详细措施。

<http://www.state.gov/r/pa/ei/othertstmy/32986.htm>