

Bio-Metrics is the Future of Industrial IoT Security (BiolloT)



الجامعة الإسلامية العالمية

International Islamic University, Islamabad

Developed by

Ch. Muhammad Imran (PhD CS)

Supervised by

Prof. Dr. Anwar Ghani (CS871)

Department of Computer Science & Software Engineering
Faculty of Applied Sciences
International Islamic University, Islamabad

Bio-Metrics is the Future of Industrial IoT Security



- **Biometrics**
 - Modalities (MultiModal 6-7)
- **IoT**
- **Industrial IoT**
- **Security**

- **Research Paradigm**
 - Industrial Research
 - Academia Research
 - Research across the Globe
 - Research in Pakistan
 - Research in IIU Islamabad

- **Literature Survey**
- **Critical Analysis**
- **Problem Statements**
- **Proposed Solutions**

- **BiolloT-2K2K research at Glance (Technology Advancements)**



Participated/Attended #IoT Labs workshops held during 2K16 (openislamabad.com)

Biometrics Research



Biometric research is the **study** of subconscious processes related to attention, cognition, emotion, and physiological arousal.

Many **researchers** worldwide **study** both explicit and implicit behavior. There is more to behavior than what the eye can see.

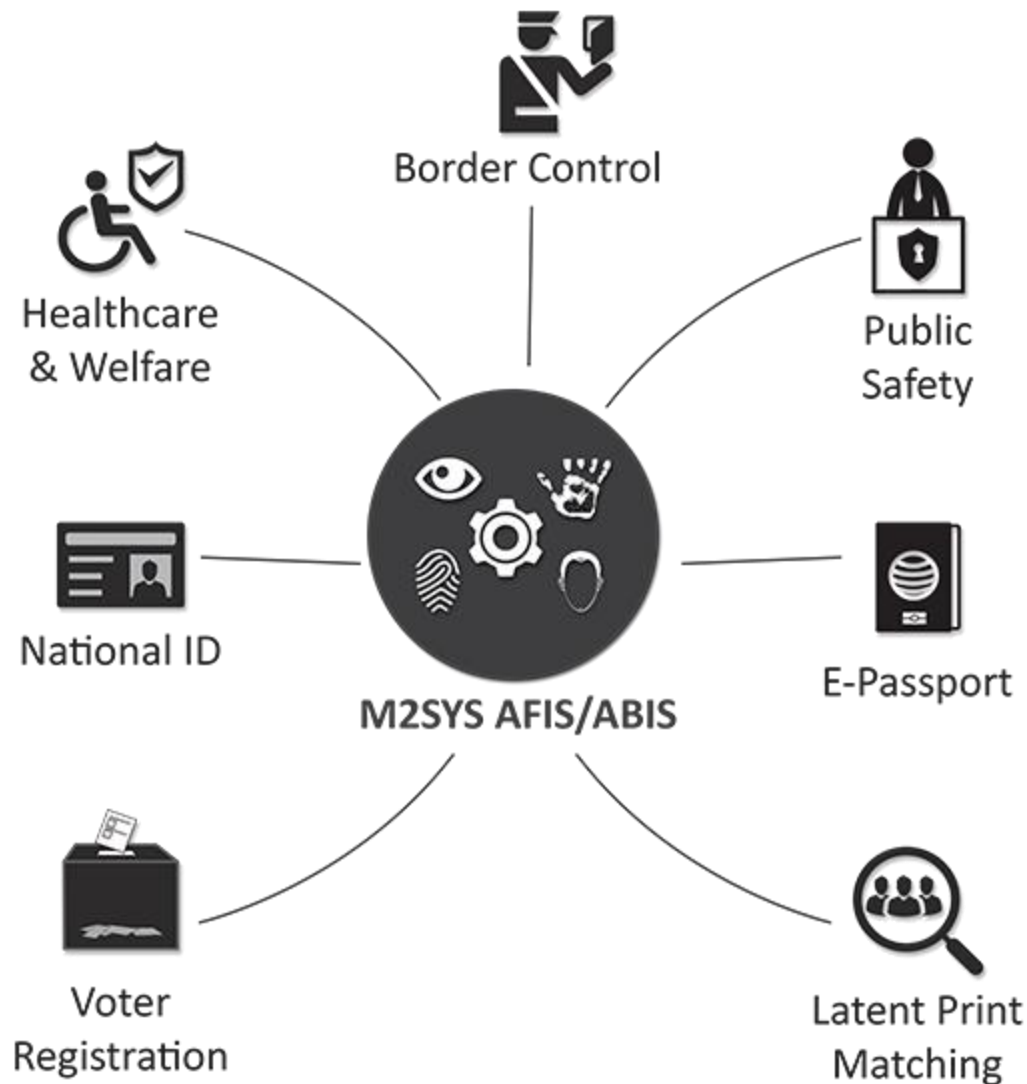
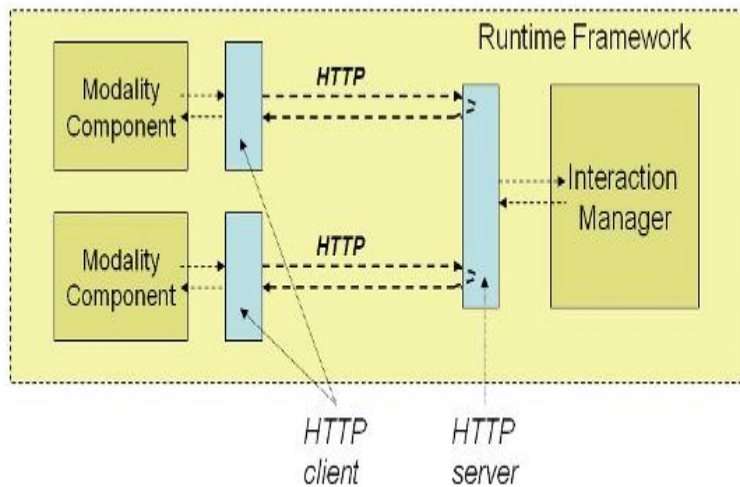
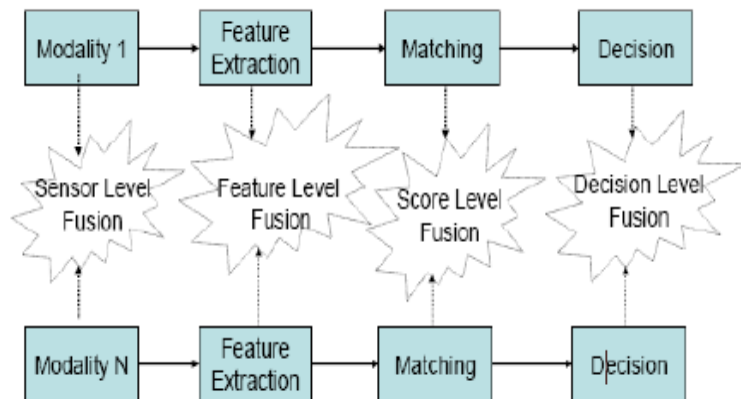
- **Fingerprints**
- **Photo and video**
- **Physiological recognition**

Facial recognition is the second most common type of authentication, according to Spiceworks, in place at 14 percent of companies. Other image-based authentication methods include hand geometry recognition, used by 5 percent of companies, iris or retinal scanning, palm vein recognition, and ear recognition.

- **Voice**
- **Signature**
- **DNA**

In practice, DNA sequencing has been too slow for widespread use. This is starting to change.

Multi-Modal Biometrics



Industrial Internet of Things



IoT-enabled pumping systems enable **industries** to install a connected, flexible, and efficient pumping system. **Industrial** Internet of things (IIoT) can transform the way **industries** work. It can create autonomous self-healing machines and enhance inventories using machine-learning.

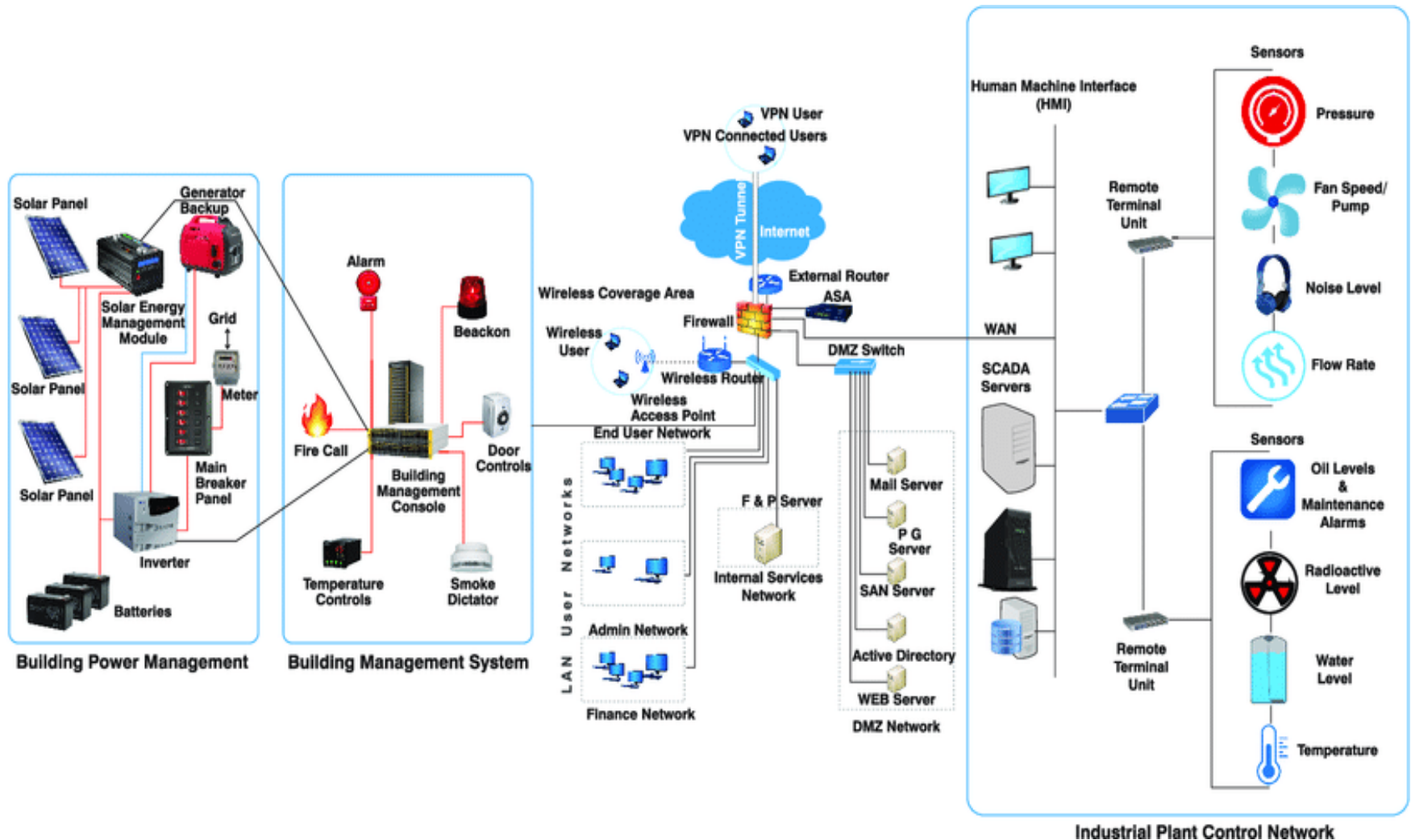
The only **difference between** those two is their general usages. While **IoT** is most commonly used for consumer usage, **IIoT** is used for industrial purpose such as manufacturing, supply chain monitor and management system.

Industrial IoT platform? defines the market for **industrial** Internet of Things (IIoT) **platforms** as a set of integrated software capabilities. The IIoT **platform** may be consumed as a technology suite or as an open and general-purpose application **platform**, or both in combination.

What does 4.0 mean?

Industry **4.0** refers to a new phase in the Industrial Revolution that focuses heavily on interconnectivity, automation, machine learning, and real-time data.

Industrial IoT Network & Security



BiolloT Future Research



Industrial IoT Market

Global Insights, Growth, Size, Comparative Analysis, Trends and Forecast, 2020-2027



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BiolloT Market Trends



The biometrics market in 2020 – changing dynamics due to pandemic

The biometrics market in a contact-less world

The biometrics market and our built environment

The contact biometrics market declines as new needs lead to shifts in investments

The biometrics consumer market in 2020 – fingerprint sensors and smartphones

Artificial intelligence biometric firms in the overall 2020 biometrics market

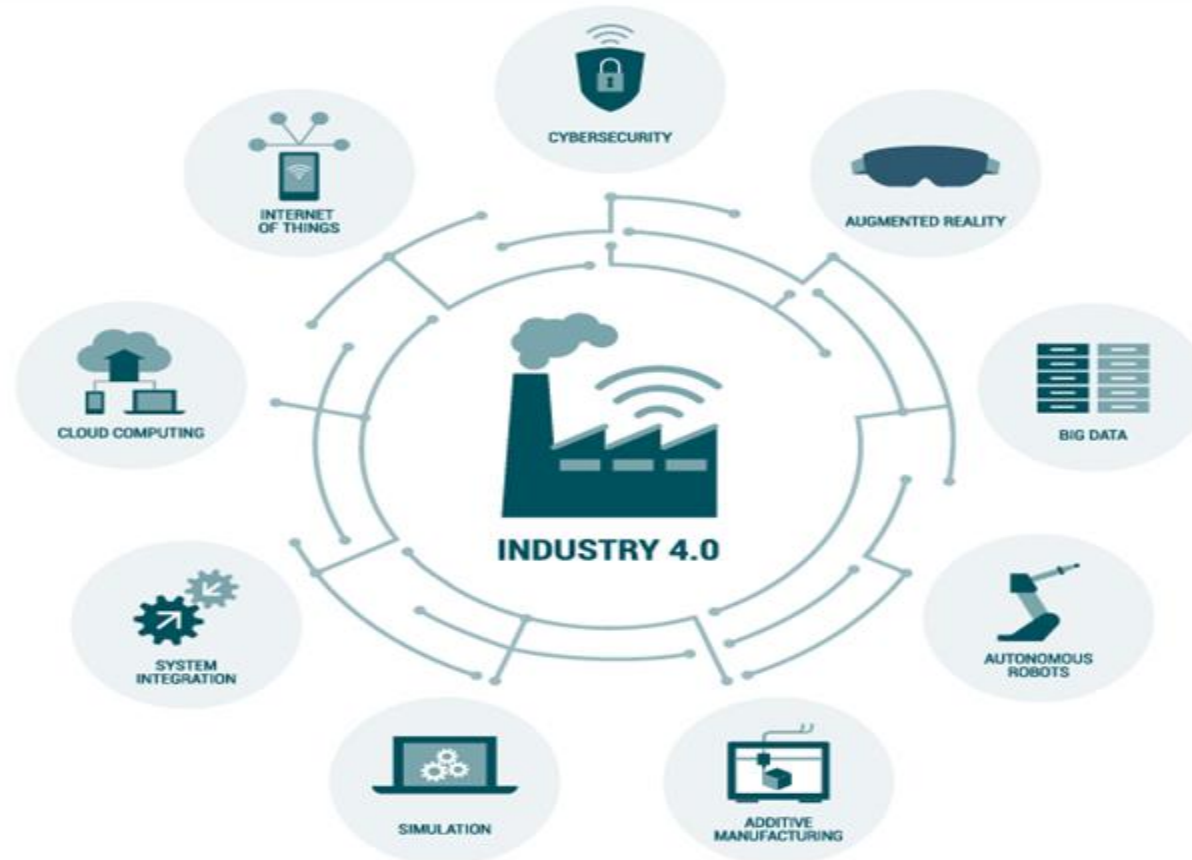
Gateways Power Nearly Every IoT Market as ABI Research Forecasts Global Shipments to Exceed 64 Million Units in 2021

Industry 4.0

INDUSTRY 4.0 - the digital transformation



3rd platform, innovation accelerators, OT and manufacturing meet in transformation



FROM INDUSTRY 4.0 TO FOURTH INDUSTRIAL REVOLUTION

Related Research Papers



A Multimodal Biometric System using Global Features for Identical Twins Identification

1,2,3Bayan Omar Muhammed and 1,2Siti Mariyam Shamsuddin

1UTM Big Data Centre, IbnuSina Institute for Scientific and Industrial Research,
Universiti Teknologi Malaysia, Johor, Malaysia

2Faculty of Computing, Universiti Teknologi Malaysia, Johor, Malaysia

3College of Science and Technology, University of Human Development, Sulaimani, KRG, Iraq

https://www.researchgate.net/publication/322797718_A_Multimodal_Biometric_System_using_Global_Features_for_Identical_Twins_Identification

A Multimodal Biometric System Using Linear Discriminant Analysis For Improved Performance

Aamir Khan¹, Muhammad Farhan², Aasim Khurshid³ and Adeel Akram⁴

1,4 Electrical Engineering Department, COMSATS Institute of IT Wah Campus
Wah Cantt., Punjab 47040, Pakistan

2 Institute of Engineering and Computing Sciences, University of Science and Technology Bannu
Bannu, KPK 28100, Pakistan

3 Software Engineering Department, University of Engineering and Technology Taxila
Taxila, Punjab 47080, Pakistan

https://www.researchgate.net/publication/51990158_A_Multimodal_Biometric_System_Using_Linear_Discriminant_Analysis_ForImproved_Performance

IJCSI.org (ISSN)

Multimodal face and finger veins biometric authentication

Muhammad Imran Razzak^{1,2 *}, Rubiyah Yusof¹ and Marzuki Khalid¹ ¹Center of Artificial Intelligence and Robotics,
Universiti Teknologi, Malaysia. ² International Islamic University, Islamabad, Pakistan

<https://academicjournals.org/journal/SRE/article-full-text-pdf/0A4C90B19352>

Related Research Papers



Received December 30, 2019, accepted January 17, 2020, date of publication January 28, 2020, date of current version February 6, 2020. Digital Object Identifier 10.1109/ACCESS.2020.2970118

Internet of Things (IoT) for Next-Generation Smart Systems: A Review of Current Challenges, Future Trends and Prospects for Emerging 5G-IoT Scenarios

KINZA SHAFIQUE 1 , BILAL A. KHAWAJA 2,3, (Senior Member, IEEE), FARAH SABIR 4 , SAMEER QAZI 4 , (Member, IEEE), AND MUHAMMAD MUSTAQIM

3 1Department of Electrical Engineering, DHA Suffa University, Karachi 75500, Pakistan 2Department of Electrical Engineering, Faculty of Engineering, Islamic University of Madinah, Madinah 41411, Saudi Arabia 3Department of Electronic and Power Engineering (EPE), PN-Engineering College (PNEC), National University of Sciences and Technology (NUST), Karachi 75104, Pakistan 4College of Engineering, PAF Karachi Institute of Economics and Technology, Karachi 75190, Pakistan Corresponding authors: Kinza Shafique (kinza.shafique@dsu.edu.pk) and Bilal A. Khawaja (7166@iu.edu.sa) This work was supported in part by the Deanship of Scientific Research, Islamic University of Madinah, Saudi Arabia, under Grant 29/40.

<https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8972389>

Received May 30, 2018, accepted July 9, 2018, date of publication July 31, 2018, date of current version August 28, 2018. Digital Object Identifier 10.1109/ACCESS.2018.2861421

A Secured Data Management Scheme for Smart Societies in Industrial Internet of Things Environment

MUHAMMAD BABAR 1,2, FAZLULLAH KHAN 3 , (Member, IEEE), WASEEM IQBAL 2 , ABID YAHYA 4 , (Member, IEEE), FAHIM ARIF 2 , (Member, IEEE), ZHIYUAN TAN 5 , (Member, IEEE), AND JOSEPH M. CHUMA 4 , (Member, IEEE)

1Department of Computing and Technology, Iqra University, Islamabad 44000, Pakistan 2Computer Software Engineering Department, National University of Sciences and Technology, Islamabad 44000, Pakistan 3Computer Science Department, Abdul Wali Khan University, Mardan 23200, Pakistan 4Department of Electrical, Computer and Telecommunication, Faculty of Engineering and Technology, Botswana International University of Science and Technology, Palapye 016, Botswana 5School of Computing, Edinburgh Napier University, Edinburgh EH10 5DT, U.K. Corresponding author: Muhammad Babar

(babar.phd@students.mcs.edu.pk)

<https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8423621>

Research Study Material



Biometric research is the study

<https://www.biometricupdate.com/202004/biometric-technology-is-the-future-of-iot-security-nec-says>

Apr 28, 2020 | [Luana Pascu](#)

<https://www.i-scoop.eu/biometrics-market-2020/>

<https://www.i-scoop.eu/internet-of-things-guide/iot-gateways/>

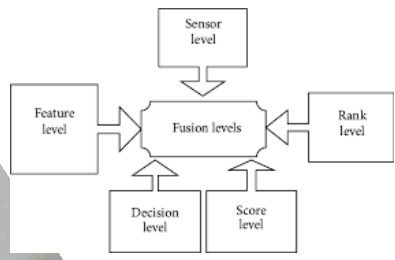
<https://www.abiresearch.com/press/gateways-power-nearly-every-iot-market-abiresearch/>

<https://www.i-scoop.eu/internet-of-things-guide/blockchain-iot/>

<https://www.i-scoop.eu/industry-4-0/>

<http://enterpriseras.com/ebio/>

Bio-Metrics is the Future of Industrial IoT Security (BiolloT)



Q & A
Thank You



Biometrics Is BAD



Biometrics are horribly inaccurate

While your fingerprint might be (nearly) unique in the world, what is stored and subsequently measured during authentication is not. Your fingerprint (or iris, retina, face, etc.) is not stored and measured as a highly detailed picture.

Biometrics can't be done by everyone

Biometrics are not secret

Biometric data is easy to copy

Biometrics are easy to fool

Biometric vulnerabilities are more true in remote scenarios

What biometric authentication I accept

I feel better about biometrics when they are paired with at least one other secret authentication factor that isn't a biometric attribute—for example, when I see fingerprint swipers that are required to also put in PINs or plug in a smartcard. I'll accept biometrics as an identifier, like typing in your logon name or email address, used as an act of convenience, but not as a sole authentication secret to prove that who is logging on is you.

enterprise Biometrics



Product 2k2k (eBio) Initial Abstract of an Idea

Purpose: Design to benefit both technical and non-technical professionals, this real world information will enable developers to develop biometric solutions without compromising the intended security enhancement.

Target Business Audience: BioMetrics User/client Services (Regional/International)

Features:

Developing a common methodology for software developers looking to integrate biometrics (MultiModal Modalities) into their applications

- End user education
- Making applications easier to use via biometrics
- Common UI (User Interface) issues regarding biometrics
- User enrollment problems and solutions
- Client/Server programming issues to consider
- Frequent error conditions and how to handle them
- Audit and event logs issues while addressing privacy



enterprise Biometrics



Seamlessly developing biometrics to enhance your existing security

- Template storage and management issues
- Template encryption issues
- Security and integrity of biometric data from source to output
- Potential security threats and solutions to them
- Export restrictions regarding certain biometric implementations

Developing API's (Application Programming Interface)

- Current status of the biometric API's
- How to use and which is best for you?
- API's and implementing a secure system
- API's and non-PC platforms
- Exploring template compatibility



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mlmran@enterpriseRAS.com

[300-9829-300](tel:300-9829-300)