Multi-Modal Bio-Metrics is the Future of Industrial Internet of Things IIoT

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1 Abstract

Multi Modal Bio-Metric concepts having vital role across the globe to address future security concerns of all the Internet based industries relay on automation products. For this, Industrial Internet of Things (IIoT) architecture implementation enhancing at large. Researchers and Industrialist completely focusing to address key points related to the time, efficiency, precision, accuracy and the security. This things relies to the global world 'implementation of the IIoT' not possible to achieve the required results without network security concerns. Unique authentication of the each industry automation process is the important parameter from hardware sensor based enrollment to the software based results matching.

- **Index Terms: Multi-Modal Bio-Metrics, Computer Science Future Trends, Network Security, Industrial Internet of Things (IIoT), Next Generation Smart Systems, Artificial Intelligence Algorithms, Encryption/Decryption Techniques.**

2 Introduction

5G solutions are extensively data hungry and security concern solutions in the future. Multi-Modal Bio-Metrics completely rely on following set of Modalities. **1. Finger 2. Thumb 3. Face 4. IRIS 5. Palm 6. Voice 7. Signature 8. DNA**

- **Same way, IIoT is the combination of Artificial Intelligence, Mobile Ultra-broadband, Super IoT and 5G. Multi-tier Architectures developed smoothly to manage IIoT infra-structure.**
- IIoT Corportate Sector Vision
- IoT Recent Research Trends
- 5G IIoT features applied on 5G Physical layer
- Intelligent Networking

3 Related Work

In this context, Researchers mainly did work in the separate domains for the multi-modal bio-metrics and the industrial internet. Islamic University of Madina Saudia Arabia computer science team extensively worked on Next Generation Smart Systems. Center of Artificial Intelligence and Robotics Malaysia Researchers produced several techniques to overcome bio-metrics related problems at security sensors level.

4 Problem Statement

As per detailed research surveys and studies, Multi-modal biometrics are extensively doubtful, ambiguous and not up-to-the-mark in the technical world of the Industrial Internet of Things (IIoT) with existing 4G-5G on-ground technologies and the forecasted way arounds. For this, multi-modal biometrics are not secret and fulfilling complete privacy elements. Same way, easy to copy, easy to make fool and still any individual unable to perform biometrics smoothly. Beside, lot of loop holes exist in the precise authentication within premises and during remote assistance. Future technology world 5G-6G bound to adopt multi-modal bio-metric attributes completely using both the mediums. Existing solutions are not completely applicable in every domain to the relevant techniques and the available methodologies.

5 Proposed Solution

Research on web services engineering and the different modalities of the multi-modal biometric addresses the problem raised in BioIIoT research proposal based presentation. For this, needs to develop secure web services framework on the basis of Architecture, Discovery, Modeling, Performance and security modules. Already different web services are in practice from long time in the world of technology including Amazon, SOAP, REST. After building/compiling the secure web services framework, it needs to be test and browse their compatibility for the related 'dynamic mechanisms' and 'interactive audio/visual remote' applications. Further, multi-threaded feature for accessing the same location in an un-controlled manner on the basis of 'Multi-threaded Service Environments' needs to be develop. Same way around, some comprehensive work required for the Multi-Modal Bio-Metric Templates considering contact-less world issues on priority basis.

- Proposed Multi-Modal
- Algorithm: Recognition based Authentication, Precise bio-metric Matching Technique
- Encrypted Network

Features: Developing a common methodology for computer science researchers and the industry based 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

6 Results and Discussion

This paper presented detailed review of existing issues exists in the Multi-Modal Bio-Metrics Systems. Which completely matches whatever current technical security plate-forms facing. Highlighted, different modalities of the Bio-Metrics

- Table I: Modalities Comparison
- Graph I: Solutions Performance Graph

Seamlessly developed 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

Developed 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

7 Conclusion

The authors would like to acknowledge importance of the Multi-Modal Bio-Metrics Systems in this 5th Generation technical world. Further, primarily focused network security of the Industrial Internet of Things (IIoT). The paper discusses in-depth about possible solutions and fixtures of the biometrics data complexity using up-to-the mark matching algorithms. This research specifically great asset for the computer science researchers in both the fields multi-modal bio-metrics and the Industrial Internet of things, beside having comprehensive solutions of the Industry giants.

- Future Work: Action-able Bio-Metrics. 6G
- Advanced Algorithm Techniques

8 References

1 enterprise Bio-Metrics www.enterpriseras.com/ebio

- enterprise Research And Solutions [eRAS] Islamabad.

2 IEEE Access - Special Section on Antenna and Propagation for 5G and Beyond

3 International Journal of Web Services Research

4 IEEE Journal Web Services Research.

5 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 KHAN3 , (Member, IEEE), WASEEM IQBAL 2 , ABID YAHYA 4 , (Member, IEEE), FAHIM ARIF2 , (Member, IEEE), ZHIYUAN TAN 5 , (Member, IEEE), AND JOSEPH M. CHUMA4 , (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

6 **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/**

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