

Challenges in Fingerprint based Biometric System

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Abstract: Fingerprint is one of the best known and well accepted biometric traits. It is an impression that gets developed on a surface touched by the lower skin of a human finger. Print pattern of a fingerprint contains a lot of black lines called ridges. A ridge can either terminate or join with other ridges at the end. Both of these points are of special interest and are called minutiae points. Location along with the direction of the minutiae point contributes towards the individuality of a fingerprint. Despite being one of the most popular and widely accepted biometric trait, performance of a automatic fingerprint based recognition system is not 100% accurate. Especially for large-scale deployments. There exist several challenges which one faces while designing an efficient fingerprint based biometric system. Some of the well known challenges are (i) designing an efficient technique to extract true feature points, (ii) Efficient technique to get stable core point (iii) Effective technique for indexing a big fingerprint database (iv) A good and distinguishable fingerprint matching technique (v) Developing an appropriate measure to determine the quality of fingerprint (vi) In presence of multiple instances of the fingerprint an efficient score fusion strategy to unify the scores for better performance (vii) Designing recognition systems for the rural population where quality of fingerprint is very poor (viii) Efficient and accurate technique to segment fingerprints automatically from a digital slap image that contains fingerprints of four fingers in a single image.

In this talk, an attempt will be made to address some of these challenges.

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Biography :Professor Phalguni Gupta who is the Director of NITTTR Kolkata, did his Ph D from IIT Kharagpur and started his carrier In 1983 by joining in Space Applications Centre (ISRO) Ahmedabad,



India as a Scientist. He was involved in the development of software for correcting satellite images of the first Indian Remote Sensing Satellite (IRS-1A). In 1987, he joined the Department of Computer Science and Engineering, Indian Institute of Technology Kanpur, India. Currently he is a Professor in the department. He works in the field of Data Structures, Sequential Algorithms, Parallel algorithms, On-line Algorithms, Image Analysis, Biometrics. He has published about 350 papers in International Journals and Conferences. He has supervised 17 Ph D and more than 100 graduate students. He has dealt with several sponsored and consultancy projects which are funded by the

Government of India. Some of these projects are in the area of Biometrics, System Solver, Grid Computing, Image Processing, Mobile Computing, and Network Flow.