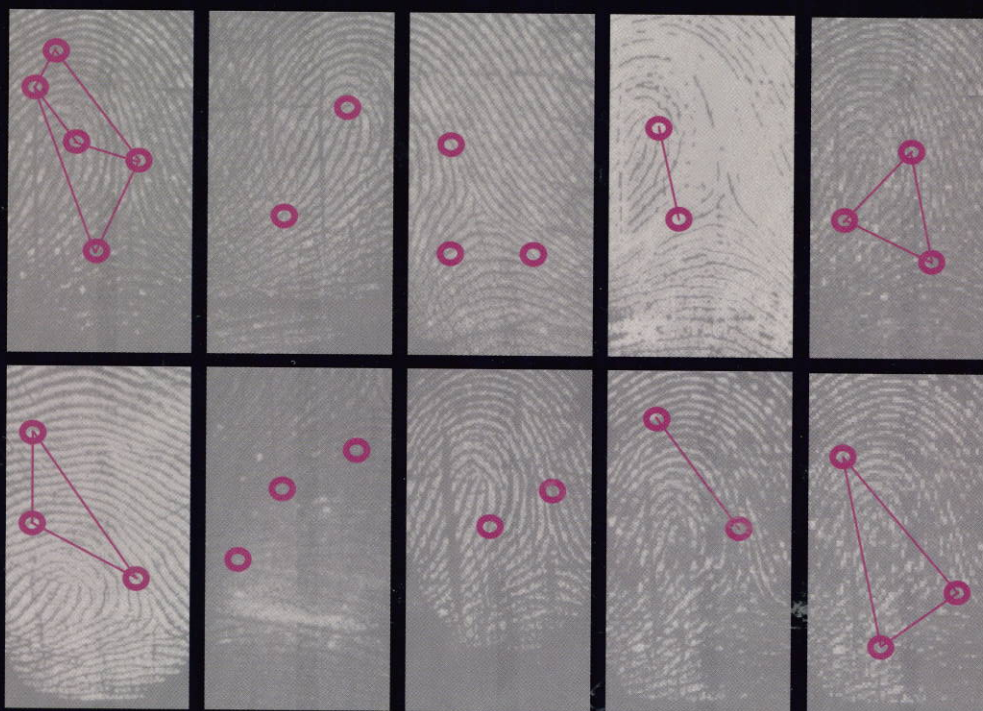


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# Computational Algorithms for Fingerprint Recognition

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Bir Bhanu    Xuejun Tan



- Feature Extraction
- Matching
- Performance Prediction
- Indexing
- Classification
- Identification

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# **Computational Algorithms for Fingerprint Recognition**

Bir Bhanu and Xuejun Tan

Biometrics such as fingerprint, face, gait, iris, voice and signature, recognizes one's identity using his/her physiological or behavioral characteristics. Among these biometric signs, fingerprint has been researched the longest period of time, and shows the most promising future in real-world applications. However, because of the complex distortions among the different impressions of the same finger, fingerprint recognition is still a challenging problem.

## **COMPUTATIONAL ALGORITHMS FOR FINGERPRINT RECOGNITION**

presents an entire range of novel computational algorithms for fingerprint recognition. These include feature extraction, indexing, matching, classification, and performance prediction/validation methods, which have been compared with state-of-art algorithms and found to be effective and efficient on real-world data. All the algorithms have been evaluated on NIST-4 database from National Institute of Standards and Technology (NIST). Specific algorithms addressed include:

- Learned template based minutiae extraction algorithm
- Triplets of minutiae based fingerprint indexing algorithm
- Genetic algorithm based fingerprint matching algorithm
- Genetic programming based feature learning algorithm for fingerprint classification
- Comparison of classification and indexing based approaches for identification
- Fundamental fingerprint matching performance prediction analysis and its validation

**COMPUTATIONAL ALGORITHMS FOR FINGERPRINT RECOGNITION** is designed for a professional audience composed of researchers and practitioners in industry. This book is also suitable as a secondary text for graduate-level students in computer science and engineering.

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