Selected Best Works from Biometrics: Theory, Applications, and Systems 2019

THE 10th IEEE International Conference on Biometrics: Theory, Applications, and Systems (BTAS) was held on 23–26 September 2019 in Tampa, FL, USA. BTAS is one of the premier global conferences on biometric recognition and includes sensors, image and signal processing, pattern recognition, artificial intelligence, and statistics. Organizers of BTAS 2019 nominated a selection of the best-reviewed papers from the conference to submit extended versions of their work to a special issue of the IEEE TRANSACTIONS ON BIOMETRICS, BEHAVIOR, AND IDENTITY SCIENCE. These submissions went through the regular peer-review process at TBIOM, including in some instances substantial further revision and improvement, leading to the set of papers appearing in this issue.

The paper "Face Phylogeny Tree Using Basis Functions" describes multiple basis methods for forming a phylogeny tree for face images. A set of images may be nearly identical, with the only difference being photometric adjustments (e.g., contrast, brightness, histogram equalization). A phylogeny tree gives the relationship and order in which the transformations may have occurred and is useful for applications such as image tampering or preservation of chain of custody. This paper was the winner of the Best Paper award and one of the people's choice Best Poster Awards at BTAS 2019.

The paper "A2-LINK: Recognizing Disguised Faces via Active Learning and Adversarial Noise Based Inter-Domain Knowledge" presents a method for face recognition in the presence of disguise. Specifically, the authors propose an active learning framework (A2-LINK) that first selects training samples from the target domain to be labeled and, using hybrid noise, fine-tunes a model that works well both in the presence and absence of disguise. The problem of face recognition in the presence of disguises is important due to its many applications in our everyday life, and it is difficult because of the scarcity of large and representative labeled databases. This leads to a few algorithms that work well for multiple covariates in unconstrained environments.

The paper "Finger Vein Template Protection Based on Alignment-Robust Feature Description and Index-of-Maximum Hashing" addresses the problems of privacy-preserving storage and secure processing of biometric templates based upon the finger vein modality. Finger vein biometric templates are known to be sparse, which results in a higher computational cost due to the requirement of multiple template shifts during the matching process. An alignment robust feature descriptor and template protection scheme are introduced and evaluated regarding invertibility as well as unlinkability.

We thank the authors for submitting extended versions of their papers and for the reviewers who contributed to improving the paper. We hope you enjoy additional details on state-of-the-art topics from some of the best-reviewed papers from BTAS 2019.

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Digital Object Identifier 10.1109/TBIOM.2020.3022299

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