

CMPE 258: Deep Learning

Short Story Proposal

Biometric Recognition Using Deep Learning: A Survey

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Source: <https://arxiv.org/pdf/1912.00271.pdf>

Abstract:

Biometric is the measurement and analysis of unique physical or behavioral characteristics of a person especially as a means of verifying personal identity. Every person has unique biometric features that cannot be copied by anyone else. Hence, using Biometrics as a measurement of recognizing identity of a person is seen at various places such as Airport security, Visa, Offices, Mobile, Laptop devices, etc. Biometric features like face, fingerprint, palmprints, ears, retinas, etc. are used for security and authentication purpose.

Deep learning models have been successful in achieving state-of-art results in many tasks like computer vision, speech recognition, color stylization, human activity identification, etc. in last few years. Deep Learning models have been leveraged to solve the problems of Biometric recognition. These have improved accuracy of biometric recognition systems.

This paper provides a comprehensive survey of some promising works on biometric recognition including face, fingerprint, iris, palmprint, ear, voice, signature, and gait recognition, which deploy deep learning models, and show their strengths and potentials in different applications. For each biometric, authors have introduced the available datasets and their characteristics followed by the promising deep learning works developed for that biometric. Further they show the performance of these works on popular public benchmarks. These works include working on GAN networks, RNN, CNN based systems. Along with this, they also discuss some of the main challenges faced while using these models for biometric recognition, and possible future directions to which research in this area is headed.

The aim of this survey is to help new researchers in this field to navigate through the progress of deep learning-based biometric recognition models, particularly with the growing interest of multi-modal biometrics systems.

In conclusion, this survey provides a summary of the recent deep learning-based models (till 2019) for biometric recognition. As opposed to the other surveys, it provides an overview of most used biometrics.