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Dynamic signature recognition

Being able to verify a person's permission to do certain actions is one of the basic components of today's society. The field of signature recognition and personal authentication in general has been researched in the last few decades and the interest kept increasing continuously since the first advanced techniques appeared.

In this work we briefly introduce the evolution of contracts and signing. We describe dynamic signature recognition, some of its advantages over offline signature recognition methods and some of its competitors that are or may become alternatives in the future.

We provide a comprehensive overview of the field based on recent literature and mention many available techniques and methods. Dynamic Time Warping and Hidden Markov Models are described in detail. Some of the most important algorithms for Hidden Markov Models, likelihood, decoding and learning, are detailed. Their general theoretical basis and their application in signature verification are presented.

We implement these two methods using the Python Programming Language. The implemented algorithms are tested on three datasets, the MCYT-100, the SVC-2004 and the ICDAR-2011, that we introduce along our implementations.

The Dynamic Time Warping algorithm has promising results. It has an average of AUC values over 0.8 on the three datasets. After fine-tuning the method can be used for security applications.