

Developing a Gait Recognition System for Healthcare: Video Analysis and Recognition Algorithms.

Executive Summary

The proposed project aims to develop a gait recognition system that can accurately identify individuals based on their walking patterns using video analysis. The project will involve the development of a database of gait patterns, the extraction of relevant features, the development and comparison of different recognition algorithms, and the evaluation of the performance of the developed system. The potential applications of the gait recognition system in security and surveillance, and healthcare, will also be explored. The expected deliverables of the project include a database of gait patterns, relevant features for recognition algorithms, different recognition algorithms, a gait recognition system, and an evaluation of its performance compared to existing methods. The project is expected to contribute to the development of biometric technologies for security and healthcare purposes.

Project Description

Gait recognition is the process of identifying individuals based on their walking patterns. It is a biometric technology that can be used in security and surveillance systems, and also in healthcare for rehabilitation and diagnosis purposes. The aim of this project is to develop a gait recognition system that can identify individuals based on their walking patterns using video analysis.

Objective:

The main objective of this project is to develop a gait recognition system that can accurately identify individuals from video footage based on their walking patterns. The specific objectives of the project are:

- To develop a database of gait patterns from video footage of individuals walking with relevant annotations.
- To extract relevant features from the gait patterns for use in recognition algorithms.
- To develop and compare different recognition algorithms, including machine learning and deep learning approaches.
- To evaluate the performance of the developed gait recognition system using a standard dataset and compare it to existing methods.
- To explore the potential applications of the gait recognition system in security and surveillance, and healthcare.

Phase Description:

The project will be carried out in the following steps:

- **Data collection:** Video footage of individuals walking will be collected from publicly available sources and from experiments conducted specifically for this project by team identified by IEM Centre or Excellence for Data Science. The same shall be validated by a medical practitioner identified by Aspic Innovations. As advised by the Aspic Innovations for initial training CASIA-B data set shall be used. But later some data sets based on the Indian origin people need to be developed for making the model robust.
- **Database development:** A database of gait patterns will be created from the collected video footage. The database will be annotated by team identified by IEM Centre or Excellence for Data

Science with metadata such as age, gender, and height of the individuals, along with on video annotations such as marker points of joints and appendages and relevant classification labels that may be used as ground truths as per the requirements of the project. The same shall be validated by a medical practitioner identified by Aspic Innovations.

- **Feature extraction:** Relevant features such as step length, step width, and foot angle will be extracted from the gait patterns using computer vision and machine learning techniques to be developed by the team of IEM Centre or Excellence for Data Science.
- **Recognition algorithm development:** Different recognition algorithms, including machine learning and deep learning approaches, will be developed and compared by the team of IEM Centre or Excellence for Data Science. The algorithms will be trained on the extracted features and evaluated using standard performance metrics such as accuracy and F1 score.
- **Evaluation:** The developed gait recognition system will be evaluated using the collected dataset and compared to existing methods. The performance of the system will be assessed using standard performance metrics.

Gantt Chart

Phase/Month	1	2	3	4	5	6	7	8
Data Collection								
Database development								
Feature extraction								
Recognition Algorithm development								
Evaluation:								

Deliverables:

The expected results of this project are:

- A database of gait patterns from video footage of individuals walking.
- Relevant features extracted from the gait patterns for use in recognition algorithms.
- Different recognition algorithms, including machine learning and deep learning approaches, developed and compared.
- A gait recognition system that can accurately identify individuals from video footage based on their walking patterns.
- An evaluation of the performance of the developed gait recognition system using a standard dataset and comparison to existing methods.
- An exploration of the potential applications of the gait recognition system in security and surveillance, and healthcare.

Conclusion:

The proposed project aims to develop a gait recognition system that can identify individuals based on their walking patterns using video analysis. The project will involve the development of a database of gait patterns, the extraction of relevant features, the development and comparison of different recognition