Deep Learning-Based Gait Recognition Using Smartphones in the Wild

- **Description:** Studying gait recognition using accelerometer and gyroscope data from smartphones. The proposed method collects inertial gait data under unconstrained conditions without knowing when, where, and how the user walks.

- **Primary objective:** To obtain good person identification and authentication performance using deep-learning techniques that learn and model the gait biometrics based on walking data.

- **Possible further applications (significance & impact):** Health Sciences - to detect early-stages of motor-neuron diseases, Sports industry, Intoxication detection.

Specific References

1. The original paper was presented in the IEEE Transactions On Information Forensics And Security, Vol. 15, 2020

2. Datasets: This project comprises of 8 sets of data. Datasets 1 to 6 are used for Person Identification and Authentication, and datasets 7 and 8 are for Gait data segmentation. The dataset is available for download on github.

3. System Requirements: Data Collection - Android Smartphone, Training Network - PyTorch 0.4.0, Python 3.6, CUDA 8.0, Intel Core Xeon E5-2630@2.3GHz, 64GB RAM and two GeForce GTX TITAN-X GPUs.

4. Code: The code is mostly written in python. The gait data extraction is done using tensorflow.

Justification for chosen Reference

- **Venue of Publication:** This paper was published in the IEEE Transactions on Information Forensics and Security, Vol. 15, in 2020.

- The work for this project involves the literature review of papers published in the International Joint Conference on Biometrics, IEEE Transactions on Systems, Man, and Cybernetics, European Conference on Computer Vision and Pattern Recognition, etc.

- **Comprehensive results and discussions:** The model effectively performed segmentation between walking and non-walking data with an accuracy of 90.22%