

## **Group Project on Societal Level Situations: Gait Recognition**

By this point in the course, students have a firm grasp of what biomechanical gait analysis entails on an individual level. To broaden their understanding of the society-level applications of these analyses, this module will focus on the concept of gait recognition or the process of identifying an individual from a distance based on biomechanical analyses of their gait pattern. There is a vast array of clinical, security, and commercial applications being developed with cutting-edge software that combines the processing and analytical power of AI platforms and gait recognition technologies. To better understand the ethical implications of such technologies in society, students will be split into groups that will critically evaluate current real-world situations where such technology is being used. Each group will have to research their assigned situation, apply an ethical framework to the situation, and present their findings during a class discussion. Groups are expected to assign at least one individual to respond to each provided question during the first 15-20 class discussions. Individual participation grades will be gauged using the AACU Ethical Reasoning Value Rubric provided below. Scores will be dependent on the individual responses/efforts as well as the group's ability to address all the questions provided.

Suggested Group Topics for Gait Recognition Technology with reference materials and discussion questions.

- Clinical Diagnosis of Pathological conditions
  - References:
    - [Applying machine learning to gait analysis data for disease identification](#)
    - [A Survey of Human Gait-Based Artificial Intelligence Applications](#)
  - Discussion Questions:
    - What are some current benefits of using gait analysis and specifically gait recognition in clinical populations? What populations (clinical and non-clinical) could specifically benefit for such technologies?
    - What are some harmful effects and/or downsides of using gait recognition to determine a clinical diagnosis?
    - Are there any economic or societal level concerns with using gait recognition for clinical diagnosis? Are there any populations that may be left out using this technology?
    - Give an example of a company that is already advertising the use of gait recognition in clinical populations. What do they specifically use it for and who are they advertising to hospitals, clinicians, or the patients? Do these motives and applications appear to be ethical?
    - Situational question: A specific gait recognition AI platform has developed the technology to accurately (60% accuracy) determine if someone has Parkinson's disease. A doctor orders the gait recognition test to be completed on a patient they are working with. The software determines a high likelihood score for the patient. The doctor informs the patient that they have Parkinsons without further tests. Using the ethical framework outlined in the Montreal Declaration, is this a responsible use of AI technology?

- Biometric access (building/room access and security)
  - References:
    - [Biometric recognition through gait analysis](#)
    - [Real-world smartphone-based gait recognition](#)
  - Discussion Questions:
    - What are the concerns with equality and the use of gait recognition to determine identity and permit access to places?
    - What specific populations might be limited or not able to use the type of biometrics?
    - Give an example of a company that is already advertising the use of gait recognition as a biometrics marker. What do they specifically use it for and who are they advertising to?
    - Imagine if WSSU had unlimited funds. Would you be open to such technology being used on campus instead of your ID card for things like accessing the cafeteria? Why or why not?
    - Using the ethical framework outlined in the Montreal Declaration, is the use of gait recognition as a biometric marker ever a responsible and ethical use of AI? Describe what that situation might look like.
- Coward Surveillance
  - References:
    - AP article on [Chinese 'gait recognition' tech IDs people by how they walk"](#).
    - [How gait recognition technology can be used at a protest](#)
  - Discussion Questions:
    - Is there an ethical difference between using gait recognition for coward surveillance in either one of these situations and a musical artist using facial recognition on concert crowds for security purposes? Compare and contrast the situations.
    - Is there an ethical difference between using gait recognition for coward surveillance in either one of these situations and the government using gait analysis to track a terrorist's movements in a coward to see where they have been and where they are going? Compare and contrast the situations.
    - What are the common ethical issues with all three of the provided situations (Uyghurs, concert crowds, and terrorist tracking) of the provided situations?)?
    - Using the ethical framework outlined in the Montreal Declaration, is the use of gait recognition for coward surveillance ever a responsible and ethical use of AI? Describe what that situation might look like.

