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Decision making through gait analysis: An application of the Transcendental Method

Gary Guerra

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Transcendental Method, ATM
Gary Guerra Ph.D.
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4th level: Decision:

What are the primary values you want your students/readers/participants to pursue?

Value 1: Value of knowledge of human gait cycle and differences between able-bodied and individuals with lower limb prosthesis

Value 2: Utility of a low-cost AI motion analysis platform in assessing walking function

Value 3: Ability to characterize and confirm observed gait with use of an AI platform

3rd level: Judgment:

How do you verify truth claims in your field in order to affirm anything?

1. The students will be able to visualize and also describe the reason for differences in gaits.
2. Upon completion of the gait analysis, students will have multiple gait trials of themselves and amputee as evidence for judging.
3. Students will confirm (validate) their subjective observational gait analysis with use of the AI platform.

2nd level: Understanding:

What should your students/readers/participants intelligently grasp if they are to understand the key concepts?

1. Students will analyze their own as well as amputee temporal-spatial gait cycles. Each student will their own data which will be compared to the amputee participants data.

1st level: Experience:

What should your students/readers/participants notice?

The students in EX3304 Biomechanics will participate in a Human Motion Analysis Laboratory. This experience will require students to demonstrate knowledge and skills from their early semester lectures on the gait cycle. To do so, the following will take place:

1. Core lectures will take place that will provide the foundation for
 - a. The human gait cycle of able-bodied (non-disabled) persons; covering walking temporal-spatial parameters (i.e. step and stride length symmetry) TBD (10/20/24)
 - b. The human gait cycle of persons wearing a lower limb prosthesis and differences in temporal-spatial parameters compared to able-bodied persons. TBD (10/22/24). Furthermore, the 'determinants of gait' will be detailed, providing

students with the mechanism of asymmetry often observed in amputee temporal-spatial parameters

- c. Students will learn how to subjectively describe gait of a person using their eyes only. Next, a quantitative objective gait analysis laboratory will be show them how to quantify and assess temporal-spatial parameters in real world settings using an artificial intelligence (AI) machine learning smartphone video based platform. TBD (10/26/24)
2. A laboratory will require students to collect their own gait cycle using the AI platform. Students will also be required to collect gait cycle of a lower limb prosthesis user invited to the campus laboratory.

An example of a gait analysis wit the online platform is here:

<https://app.opencap.ai/analysis-dashboard/331?trialId=4ff75762-d71f-426b-a8f5-cf61c67f0c7a&subjectId=undefined&shareToken=undefined>

