Bioengineering Day Poster Addendum
Group 27

1. Desired Needs
    - Pediatric patients with CP and other foot pathologies lack a clinically validated foot model that captures midfoot motion within the existing Rady Marker Set.
    - Creating a 2-segment foot model capable of distinguishing hindfoot and midfoot kinematics to improve diagnostic accuracy and guide more personalized treatment decisions for those with Cerebral Palsy.
2. Constraints
    a. Global Impact: Establishing a lab-specific normative dataset using a clinically feasible marker set contributes to a growing body of pediatric gait literature and provides a framework for other pediatric gait labs to operate under similar constraints.
    b. Safety/Regulatory Affairs/Risks/Manufacturability/Quality Control: This project does not involve any FDA regulatory constraints, risks, involvement with a manufactured device or product, or involvement with a commercial product.
3. Engineering Standards
    a. The validation and normative data collection methodology developed here could serve as a standardized protocol for future 2-Segment foot model studies at pediatric gait laboratories.
4. Ethical, Environmental, and Societal Concerns
    a. All patients data was collected under IRB approval and handled in compliance with HIPAA.
    b. Improved diagnostic accuracy in pediatric gait can improve quality of life outcomes for children with CP.
5. Teamwork and Leadership
    a. Collaboration with surgeons, physical therapists, and biomechanics at Rady Children's Hospital all informed decisions in design and validation.
    b. Goals and deadlines were structured on the timeline of the class in order to properly finish the project.
    c. Periodic feedback from collaborators was incorporated throughout the model development process, especially after the validation testing.
6. The gap between what single segment foot models can capture and what CP patients actually present with clinically motivated the need to acquire deeper knowledge of multi-segment foot modeling, coordinate system construction, and pediatric gait biomechanics.
7. The normative dataset produced by this study is the first of its kind at Rady Children's Hospital and creates a reusable clinical reference tool that will directly support future patient care and research at the lab.