EVENT DETAILS

Our event was a collaboration between 3 labs from 3 schools and 4 departments at UVA:
- Motion Analysis and Motor Performance Lab from Orthopaedic Surgery and Mechanical Engineering in the Schools of Medicine and Engineering
- Multiscale Muscle Mechanophysiology Lab from Biomedical Engineering
- Exercise and Sport Injury Lab from Kinesiology in the Curry School of Education and Human Development

Involvement

Monticello High School
- April 10, 2019
- 10:30 am – 12:30 pm
- Small Gym
- Elective period for students in the Health and Medical Science Academy

Albemarle High School
- April 18, 2019
- 1:15 – 2:30 pm
- Small Gym
- Class time for Anatomy and Physiology class

GOALS

- Introduce students to multiple disciplines studying biomechanics
- Demonstrate technologies used to explore biomechanics
- Illuminate the plethora of fields that fall under “biomechanics”

ACTIVITIES

Learning Under Pressure: Basics of Balance

With the Exercise and Sport Injury Lab

- Instrumented demo of balance/center of pressure and base of support using a force plate and a star excursion balance test
- Students stood on force plate and attempted to move their center of pressure outside of their base of support, as monitored in real time

Objectives

- Students learned principles of static balance, such as if your center of pressure leaves your base of support, you are falling over.
- Students learned how force plates can be used in evaluation of balance.

Arms of Muscles and Moments (and also Models)

With the Multiscale Muscle Mechanophysiology Lab

- Using a pulley system made of rulers and strings, students adjusted attachments and weights to balance loads about joints to explore moment arms
- Students applied these concepts to modify a simplified musculoskeletal model in OpenSim, further examining muscle geometry and force production on joint moments

Objectives

- Students learned how muscles create moment arms around joints, and how length of moment arms affect function.
- Students learned how biomechanists use modeling to study complex problems.

STUDENT FEEDBACK

- In past years we asked high school teachers to survey their students after the event about what they learned and which aspects they liked or didn’t
- Working with these same teachers, we revised this year’s activities to be more interactive and include more diverse activities
- After this year’s events we again asked teachers to gather feedback from students so we can continue exciting biomechanics for NBD 2020!