KIN 147
Lab 07: Walking Video and GRF Data Collection – Implementing the Biomechanical Model for Walking

GENERAL INSTRUCTIONS

• Labs will be conducted in two parts: Monday labs will be for data collection; Wednesday labs will be for data analysis.
  o Data Collection Days
    ▪ You will be assigned to 1 of 4 groups
    ▪ Each group will have 5 students
  • One student in each group will be the participant
    o The student who is the participant will change each week
    o No student can be the participant a second, or third, time until all of the members of the group have been the participant for the first, or second, time.
  • The other four students will collect the data
• If you are the participant, you MUST wear the following during data collection sessions
  o Athletic shoes
  o Tight-fitting shorts (no leggings, no yoga pants, no baggy shorts!)
    ▪ Examples: biking shorts, compression shorts, and spandex shorts
  o A tight-fitting t-shirt
• Failure to wear the appropriate clothing will result in a loss of 20% for the entire lab group.

LAB SPECIFIC INSTRUCTIONS

• Read the instructions COMPLETELY before coming to your data collection session.
• You will be collecting 2D video and ground reaction force data.
• Each member of your group will be performing the following walks.
  o Forefoot Walking (Shod)
  o Forefoot Walking (Barefoot)
• Pre-Movement Activities
  o BEFORE coming to the data collection lab section, your lab group should get together and MAKE SURE, the participant
    ▪ KNOWS exactly what movement they are going to perform
    ▪ PRACTICES the movement before coming to lab
    ▪ Points will be DEDUCTED if from each member of your lab group, if the participant is NOT PREPARED for the data collection session.
  o For the Participant
    ▪ Wrap flexwrap around the left thigh (once) 3-4 inches above the knee
    ▪ Wrap flexwrap around the left thigh (once) as close to the pelvis as possible
- **Video camera setup**
  - You will be using two video cameras
  - Turn on each video camera. Look at the digital viewfinder and perform the following:
    - Put the camera into the Shutter Speed AE mode
      - There is a circular dial on the top of the video camera
      - Rotate this dial until a capital letter “S” appears in the middle top of the display.
    - There is a circular ring around the “set” button
      - Push the bottom edge of the ring. This will bring up menu on the left hand side of the display
    - Set the camera EV shift to +1.0
      - Push the top edge of the ring to move the selection to the label “EV Shift”
      - Push the right edge of the ring to change the EV shift to +1.0
    - Set the camera shutter speed to 1/1000 of a second
      - Push the top edge of the ring to move the selection to the label “S”
      - Push the right edge of the ring to change the shutter speed to “1/1000”
    - Set the camera focus to “∞”
      - Push the top edge of the ring to move the selection to the label “focus”
      - Push the right edge of the ring to change the focus to “∞”
    - Set the camera white balance to “Day/White Fluorescent”
      - Push the top edge of the ring to move the selection to the label “white balance”
      - Push the right edge of the ring to change the white balance to “DayWhite Fluorescent”
      - “Push the “set” button
  - Press the “menu” button
    - Two tab menus will appear at the left edge of the display
    - Make sure the tab with the little camera is selected
      - If it is not, push the left edge of the ring to select the current tab
      - Push the top edge of the ring surrounding the “set” button to select the tab with a little camera on it.
      - Push the right edge of the ring surrounding the “set” button to select the menu for this tab
    - Push the bottom edge of the ring surrounding the “set” button to select “Movie Quality”
    - Push the right edge of the ring surrounding the “set” to bring up a list of camera speeds (i.e., frame rates).
    - Push the top or bottom edge of the ring surrounding the “set” to select HS240.
    - Push the “set” button.
    - The letters and numbers HS240 should in the top right corner of the display if you do this correctly.
Place the video cameras and tripods in their NEW designated locations.

Adjust each video camera and tripod for each participant

- Make sure the video camera is horizontally level (left-to-right AND front-to-back)
  - In the video camera field of view, the floor should be horizontal
  - Look at the camera from the side, it should not be tilted down or up. It should be level horizontally.
- Adjust the video camera and tripod so that they are perpendicular to the sagittal plane of the walker
  - In the video camera field of view, the 2-inch wide white line should point straight towards the opposite wall.
- Adjust the tripod so the lens of the video camera is at the height of the greater trochanter of the participant when they are standing on the force plates
- Adjust the video camera zoom
  - Using the video camera’s zoom feature, zoom the field of view so that the participant’s head is close to the top of the field of view.

In your data collection journal,

- Before a member of your group performs their walks, you must record the following:
  - The name of the student performing the walks (the participant)
- After each walk, you must record the following:
  - Which walk was performed?
  - Whether or not the walk was a good data collection trial or one that needed to be redone
- For this lab, a good forefoot walk occurs if
  - the forefoot of the LEFT FOOT makes initial contact with the first force plate AND
  - the heel does not touch down (also the heel should be no more than approximately 1 inch off the ground), AND
  - the participant DOES NOT CHANGE their STRIDE or their CADENCE when walking over the force plates when compared to their stride and cadence before reaching the force plate – THIS IS IMPORTANT – don’t look down at the force plates
- Ms. Watson and Dr. Kao will determine if an acceptable forefoot walk has been performed.
  - If a walking trial is not acceptable, you will have to collect another trial
- Your group has 25 minutes to collect everyone participant’s data

Data Collection Activities

- Collecting the Data (Ms. Watson or Dr. Kao will stop the data collection each time these instructions are not being followed exactly as written)
  - The participant will initially stand where the two white lines intersect on the first force plate. The participant must face the east wall
  - You will be calibrating this standing height
  - Once everyone is ready, the student in charge of data collection gives the command to START the video cameras.
The students in charge of each video camera performs the following:
  • Push the button with the “solid red circle” on it.
  • **BE CAREFUL TO NOT MOVE THE VIDEO CAMERA WHEN YOU PUSH THIS BUTTON**

The student in charge of the data collection then waits 2 seconds and then gives the command **FOR THE PARTICIPANT TO walk to the starting point (orange cone I)** for the walking trial at the end of the green walkway near the desk area.

Once the participant is in the starting position, the student in charge of data collection gives the command **READY**.

Dr. Kao or Ms. Watson will start the vertical ground reaction force data collection system and say **GO**.

The student in charge of the data collection then waits 2 seconds and then gives the command for the participant to **perform the required walk**.

After the participant’s the end of the walk (orange cone II),
  • **The video data collectors perform the following:**
    o Push the button with the “solid red circle” on it.
    o **BE CAREFUL TO NOT MOVE THE VIDEO CAMERA WHEN YOU PUSH THIS BUTTON**

Repeat the preceding steps for the other footwear condition.

Repeat the process for each member of your group.

**KEEP THE FOLLOWING IN MIND:**
1) Your lab grade is dependent on good data collected by your lab partners.
   a) If you don’t believe good data were collected for any reason, redo the walk
2) There will be **NO** changes to lab grades because poor data were collected.