Video dataset for Assessing ACL Injury Risk in Female Athletes

Dataset [1] collected for the task of capturing performance-related information from videos of athletes. Collected with a focus on female athletes, as they tend to show higher risk of injury.

- Video data summary:





- Organization of video files:

Participant ID (PID)

- Keyframes of jumps: "clipped_athletic_data_key_points_in_video.xlsx"
 - Provides key points frame numbers in jump videos:
 - Lowest Point of Jump: First squat that the participant performs when landing on the force plate.
 - **Highest Point of Jump:** Highest point that the participant reaches when performing the jump part of the evaluative motion.
 - Final Landing: Second point of impact on force plate, when participant lands after the jump.

Countermovement Jump – key events:



Drop Jump – key events:



- Force Plate data collected during jumps:
 - Countermovement Jumps: "Athletic Research Project CMJ.xlsx"
 - Variables: Braking Phase Duration:Concentric Duration, Braking Phase Duration:Contraction Time ,Braking Phase Duration [s],Concentric Duration [ms],Concentric Impulse-50ms [Ns], Concentric Impulse-100ms [Ns], Concentric Impulse [Ns], Concentric Maximum RFD [N/s],Concentric Mean Force [N],Concentric Mean Power / BW [W/kg],Concentric Mean Power [W],Concentric Peak Force / BW [N/kg],Concentric Peak Force [N],Concentric Peak Velocity [m/s],Concentric RFD - 50ms [N/s],Concentric RFD - 100ms [N/s],Concentric RFD - 200ms [N/s],Concentric RFD / BW [N/s/kg],Concentric RFD [N/s],Concentric RPD-50ms / BW [W/s/kg], Concentric RPD - 50ms [W/s], Concentric RPD-100ms / BW [W/s/kg], Concentric RPD -100ms [W/s],Concentric RPD / BW [W/s/kg],Concentric RPD [W/s],Concentric Time to Peak Force [ms], Contraction Time: Eccentric Duration [%], Contraction Time [ms], Countermovement Depth [cm], Eccentric: Concentric Duration [%], Eccentric: Concentric Mean Force Ratio [%], Eccentric Acceleration Phase Duration [s], Eccentric Braking Impulse [Ns], Eccentric Braking RFD-100ms / BW [N/s/kg], Eccentric Braking RFD-100ms [N/s], Eccentric Braking RFD / BW [N/s/kg], Eccentric Braking RFD [N/s], Eccentric Deceleration Impulse [Ns], Eccentric Deceleration Phase Duration [s], Eccentric Deceleration RFD / BW [N/s/kg], Eccentric Deceleration RFD [N/s], Eccentric Duration [ms], Eccentric Mean Braking Force [N], Eccentric Mean Deceleration Force [N], Eccentric Mean Force [N], Eccentric Mean Power / BW [W/kg], Eccentric Mean Power [W], Eccentric Peak Force / BW [N/kg], Eccentric Peak Force [N], Eccentric Peak Power [W], Eccentric Peak Velocity [m/s], Eccentric Unloading Impulse [Ns], Flight Time: Contraction Time, FlightTime: Eccentric Duration, Flight Time [ms], Force at Peak Power [N], Force at Zero Velocity [N], Jump Height (Flight Time) [cm], Jump Height (Flight Time) in Inches [in], Jump Height (Imp-Dis) [cm], Jump Height (Imp-Mom) [cm], Jump Height (Imp-Mom) in Inches [in], Lower-Limb Stiffness [N/m], Mean Eccentric+Concentric Power: Time [W/s], Minimum Eccentric Force [N], Movement Start to Peak Force [s], Movement Start to Peak Power [s], P1 Concentric Impulse [Ns],P2 Concentric Impulse [Ns],Peak Net Takeoff Force / BW [N/kg],Peak Power / BW [W/kg], Peak Power [W], Positive Impulse [Ns], Positive Takeoff Impulse [Ns], RSI-modified [m/s], Start of Braking Phase [s], Start of Concentric Phase [s], Start of Eccentric Deceleration Phase [s], Start of Integration [s], Start of Movement [s], Start of Movement Detection Threshold [N], Takeoff Peak Force / BW [N/kg], Takeoff Peak Force [N], Time to Braking Phase [s], Total Work [J], Velocity at Peak Power [m/s], Jump Height (FT) Relative Landing RFD [N/s/cm], Jump Height (FT) Relative Peak Landing Force [N/cm], Landing Net Peak Force / BW [N/kg], Landing RFD [N/s], Mean Landing Power [W], Peak Landing Acceleration [m/s²], Peak Landing Force / BW [N], Peak Landing Force [N], Peak Landing Power [W], Peak Landing Velocity [m/s], Peak Takeoff Acceleration [m/s²],"Athlete Standing Weight Asymmetry [% L,R]","Concentric Impulse-50ms Asymmetry [% L,R]", "Concentric Impulse-100ms Asymmetry [% L,R]", "Concentric Impulse Asymmetry [% L,R]","Concentric Maximum RFD Asymmetry [% L,R]","Concentric Mean Force

Asymmetry [% L,R]", "Concentric Peak Force Asymmetry [% L,R]", "Concentric RFD Asymmetry [% L,R]","Concentric Time to Peak Force Asymmetry [% L,R]","Eccentric:Concentric Mean Force Ratio Asymmetry [% L,R]", "Eccentric Braking Impulse (Asymmetry) [% L,R]", "Eccentric Braking RFD-100ms Asymmetry [% L,R]","Eccentric Braking RFD Asymmetry [% L,R]","Eccentric Deceleration Impulse (Asymmetry) [% L,R]", "Eccentric Deceleration RFD Asymmetry [% L,R]","Eccentric Mean Force Asymmetry [% L,R]","Eccentric Peak Force Asymmetry [% L,R]","Eccentric Unloading Impulse (Asymmetry) [% L,R]","Force at Peak Power Asymmetry [% L,R]","Force at Zero Velocity Asymmetry [% L,R]","P1 Concentric Impulse Asymmetry [% L,R]","P2 Concentric Impulse Asymmetry [% L,R]","Positive Impulse Asymmetry [% L,R]","Positive Takeoff Impulse Asymmetry [% L,R]","Start of Movement Asymmetry [% L,R]","Takeoff Peak Force Asymmetry [% L,R]","Landing RFD Asymmetry [% L,R]","Peak Landing Force Asymmetry [% L,R]", Athlete Standing Weight (Left) [kg], Athlete Standing Weight (Right) [kg],Concentric Impulse-50ms (Left) [Ns],Concentric Impulse-50ms (Right) [Ns],Concentric Impulse-100ms (Left) [Ns], Concentric Impulse-100ms (Right) [Ns], Concentric Impulse (Left) [Ns], Concentric Impulse (Right) [Ns], Concentric Maximum RFD (Left) [N/s], Concentric Maximum RFD (Right) [N/s], Concentric Mean Force (Left) [N], Concentric Mean Force (Right) [N], Concentric Peak Force (Left) [N], Concentric Peak Force (Right) [N], Concentric RFD (Left) [N/s], Concentric RFD (Right) [N/s], Concentric Time to Peak Force (Left) [ms], Concentric Time to Peak Force (Right) [ms], Eccentric: Concentric Mean Force Ratio (Left) [%], Eccentric: Concentric Mean Force Ratio (Right) [%], Eccentric Braking Impulse (Left) [Ns], Eccentric Braking Impulse (Right) [Ns], Eccentric Braking RFD-100ms (Left) [N/s], Eccentric Braking RFD-100ms (Right) [N/s], Eccentric Braking RFD (Left) [N/s], Eccentric Braking RFD (Right) [N/s], Eccentric Deceleration Impulse (Left) [Ns], Eccentric Deceleration Impulse (Right) [Ns], Eccentric Deceleration RFD (Left) [N/s], Eccentric Deceleration RFD (Right) [N/s], Eccentric Mean Force (Left) [N], Eccentric Mean Force (Right) [N], Eccentric Peak Force (Left) [N], Eccentric Peak Force (Right) [N], Eccentric Unloading Impulse (Left) [Ns], Eccentric Unloading Impulse (Right) [Ns], Force at Peak Power (Left) [N], Force at Peak Power (Right) [N], Force at Zero Velocity (Left) [N], Force at Zero Velocity (Right) [N], P1 Concentric Impulse (Left) [Ns], P1 Concentric Impulse (Right) [Ns], P2 Concentric Impulse (Left) [Ns], P2 Concentric Impulse (Right) [Ns], Positive Impulse (Left) [Ns], Positive Impulse (Right) [Ns], Positive Takeoff Impulse (Left) [Ns], Positive Takeoff Impulse (Right) [Ns], Start of Movement (Left) [s], Start of Movement (Right) [s], Takeoff Peak Force (Left) [N], Takeoff Peak Force (Right) [N], Landing RFD (Left) [N/s], Landing RFD (Right) [N/s], Peak Landing Force (Left) [N], Peak Landing Force (Right) [N].

- Drop Jumps: "Athletic Research Project Drop Jump.xlsx"
 - Variables: Concentric Impulse [Ns],Concentric Mean Force [N],Concentric Mean Power / BW
 [W/kg],Concentric Mean Power [W],Concentric Peak Velocity [m/s],Countermovement Depth
 [cm],Eccentric:Concentric Mean Force Ratio [%],Eccentric Mean Force [N],Flight Time [ms],Force
 at Zero Velocity [N],Jump Height (Flight Time) [cm],Jump Height (Flight Time) in Inches [in],Jump
 Height (Imp-Dis) [cm],Jump Height (Imp-Mom) [cm],Jump Height (Imp-Mom) in Inches
 [in],Movement Start to Peak Power [s],Peak Power / BW [W/kg],Peak Power [W],Positive
 Impulse [Ns],Positive Takeoff Impulse [Ns],Start of Concentric Phase [s],Jump Height (FT)
 Relative Landing RFD [N/s/cm],Jump Height (FT) Relative Peak Landing Force [N/cm],Landing Net
 Peak Force / BW [N/kg],Landing RFD [N/s],Mean Landing Power [W],Peak Landing Acceleration
 [m/s²],Peak Landing Force [N],Peak Landing Power [W],Peak Landing Velocity [m/s],Peak Takeoff
 Acceleration [m/s²],"Concentric Impulse Asymmetry [% L,R]","Concentric Mean Force
 Asymmetry [% L,R]","Force at Zero Velocity Asymmetry [% L,R]","Positive Impulse
 Asymmetry [% L,R]","Positive Takeoff Impulse Asymmetry [% L,R]","Landing RFD Asymmetry [% L,R]","Peak Landing Force Impulse

(Right) [Ns],Concentric Mean Force (Left) [N],Concentric Mean Force (Right)
[N],Eccentric:Concentric Mean Force Ratio (Left) [%],Eccentric:Concentric Mean Force Ratio
(Right) [%],Eccentric Mean Force (Left) [N],Eccentric Mean Force (Right) [N],Force at Zero
Velocity (Left) [N],Force at Zero Velocity (Right) [N],Positive Impulse (Left) [Ns],Positive Impulse
(Right) [Ns],Positive Takeoff Impulse (Left) [Ns],Positive Takeoff Impulse (Right) [Ns],Landing RFD
(Left) [N/s],Landing RFD (Right) [N/s],Peak Landing Force (Left) [N],Peak Landing Force (Right)

[1] Blanchard, N., Skinner, K., Kemp, A., Scheirer, W. and Flynn, P., 2019, January. "Keep Me In, Coach!": A Computer Vision Perspective on Assessing ACL Injury Risk in Female Athletes. In 2019 IEEE Winter Conference on Applications of Computer Vision (WACV) (pp. 1366-1374). IEEE.

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