# ACL Rehabilitation App for Side Hop Jump Classification

## Data details

Standardized Rebound Side Hop (SH) are used in U-Motion laboratory to assess movement quality of ACL Injured patients (P), Athletes (At) and Controls (C). For more details of this task and data se “SH info v2.txt”

* For this project the three groups (P,At,C) are not important, they are considered as one population. Instead they are divided into groups one with “good” movement pattern and one with “less good” movement pattern. Also there is a group with undefined movement quality that can be left out. See groups\_lat\_A\_ND.xlsx
* Data provided will have more data then needed for this project. Student have to extract relevant data.
* Data are exported as timenormalized (101 frames) biomechanical variables (angles, moment of force (mom) and EMG) from the two landing phases in the side hop, lateral (lat) and medial (med). In this project focus on lateral landing.
* Data includes both legs but for this project focus on Affected (A) leg for P and Non-Dominant (ND) for At and C.
* Data contains multiple repetitions from all individuals. Some individuals also have multiple Test sessions (T1,T2,T3). Important when training and testing machine learning model to exclude ALL repetitions from training set from individual that is in test/validation set.
* Data from foot, knee, hip, pelvis and trunk are provided (24 variables). See if some data might better be excluded. Foot, knee and hip is prioritized.
* Moment of force (\_mom\_)(torque) is secondary priority, focus on angles first.
* Leave Electromyography (EMG) for later. Might be interesting to see if it improves the model later on.
* Since there are only two classes (“good” and “less good”) feedback to user will be limited. Find a simple feedback interface to encourage participant to improve movement quality. If less good, then an explainable IA method could be used to find what variables influenced decision the most, and improve feedback.
* Summary:
  + Use Lateral landing lat, angles, \_A\_, \_ND\_
  + Skip Medial landing med, \_mom\_, \_NA\_, \_D\_, EMG

build\_dataset\_SH.py can be used to read data but verify the code first

## Data usage

Students will be provided with data collected at U-Motion laboratory. Students must agree to handle data safely and not share data to third party unless permitted to. After project end student shall remove provided data from there computers.