Vertical Jump Height Prediction with Upper-limb Counter-movement, Pre-jump Knee-Flexion and Approaching Distance in Volleyball Players

Student: Chu Ho Man Jason  
Programme: BENG4-ECE  
Supervisor: Dr. Chan Rosa, H M  
Co-supervisor: Dr. Roy Cheung (PolyU)

Objective/Background

• Investigate the relationship between Arm Swing Angle, Knee Angle and Approaching Distance during Vertical Jump  
• Provide Scientific Way to evaluate Jump performance  
• Enhance the Performance of Volleyball Players

Methodology

• Experiment is held in the Polytechnic University  
• 20 Subjects are recruited aged from 18 to 45  
• Measure the Jump Height with Vertical Jump meter  
• Obtain Joint Angles by using Naraxon (16 Sensors)  
• Use Force Plate to receive Force Response  
• Use MATLAB and Least-Square Regression to find out the Relationship between predictors and Vertical Jump Height

Results/Application

• Force contribute the more in Vertical Jump  
• Increase Right Knee Angle, Right Shoulder Angle, Right Shoulder Angular Velocity, and Upper Limb Length can provide a higher Vertical Jump Height  
• Sensors to monitor and improve Right Shoulder Angle Velocity is more controllable in Real Sport Situation