

Application of Sport Biomechanics analysis for performance enhancement

Michelle Ng

Assistant Sport Biomechanics Manager
Sport Biomechanics and Technology Centre

Seminar Outline

1. Introduction
2. Testing in Lab vs On-field support
 - Equipment
3. Technique analysis
 - In lab
 - Case studies – Athletics & Track Cycling
4. Games analysis
 - Introduction
 - Case studies – Squash
5. Technology – Para Badminton

Testing in Lab vs Onfield-support

Pros:

Controlled setting

Accurate and huge amount of data collection

Cons:

Not familiar environment
for athletes

Time consuming –
Planning, setups,
testing, analysis



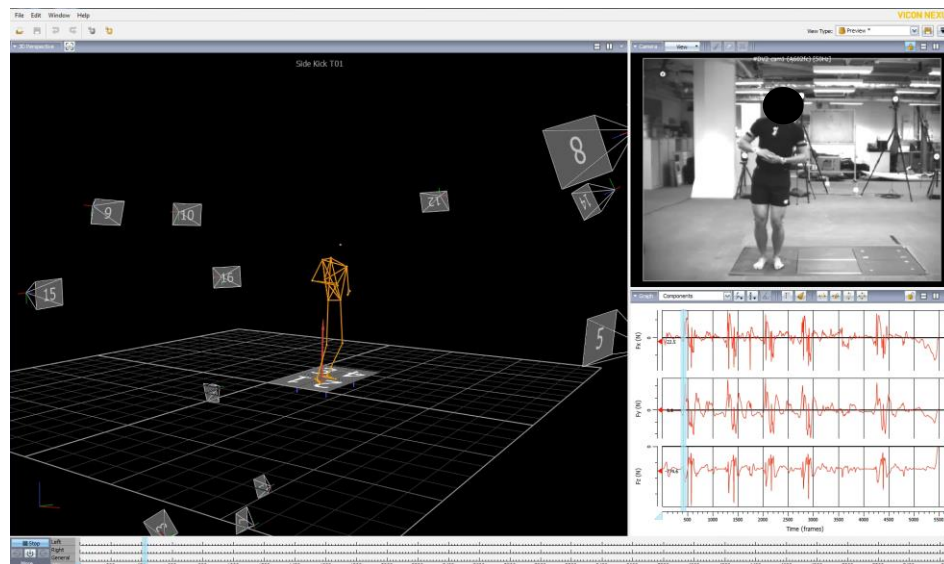
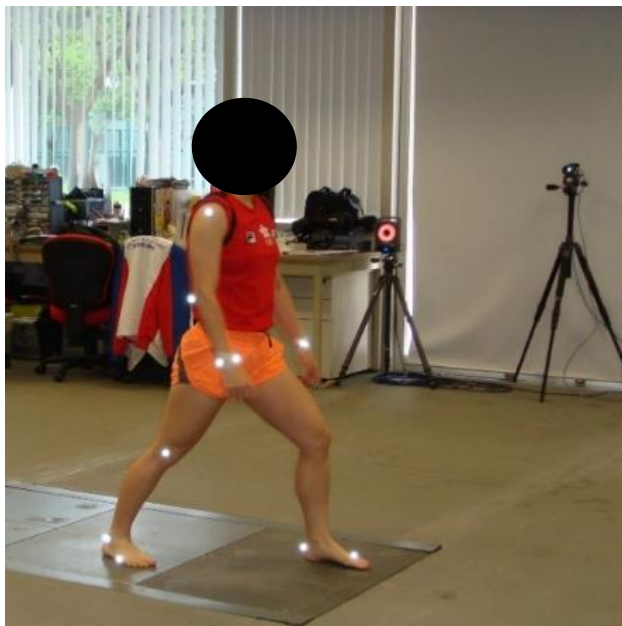
Testing in Lab vs Onfield-support

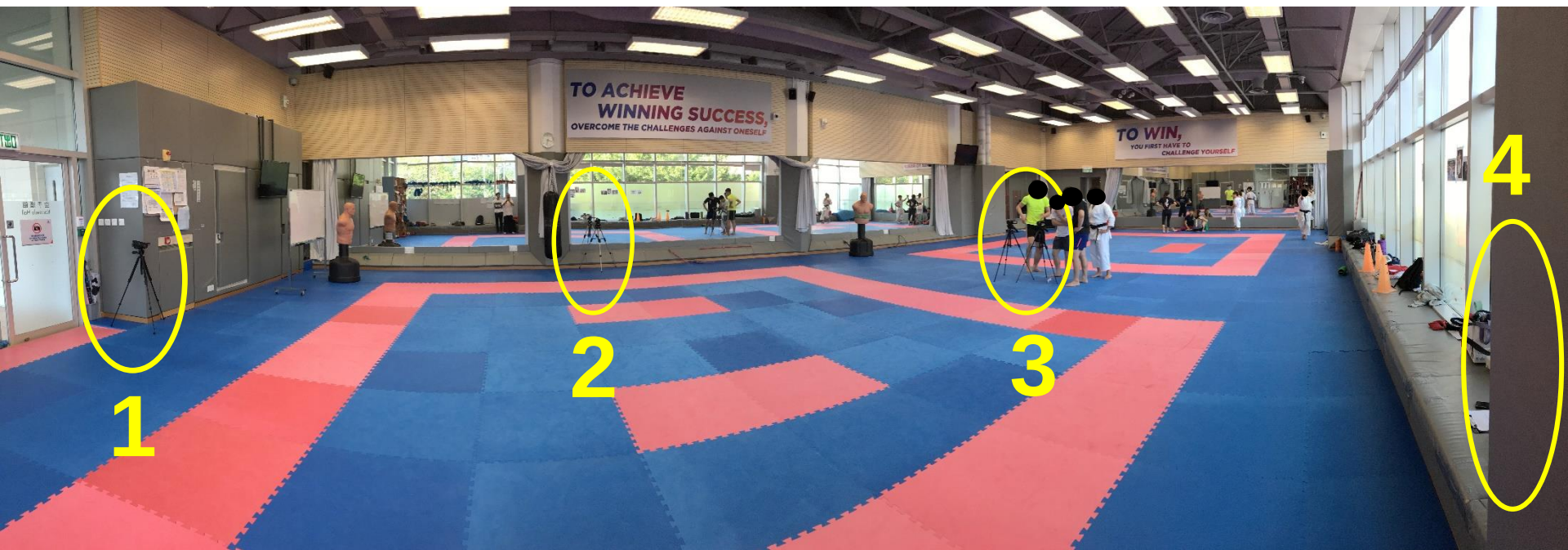


Technique Analysis

Karate – Kata/Team Kata

(Video)

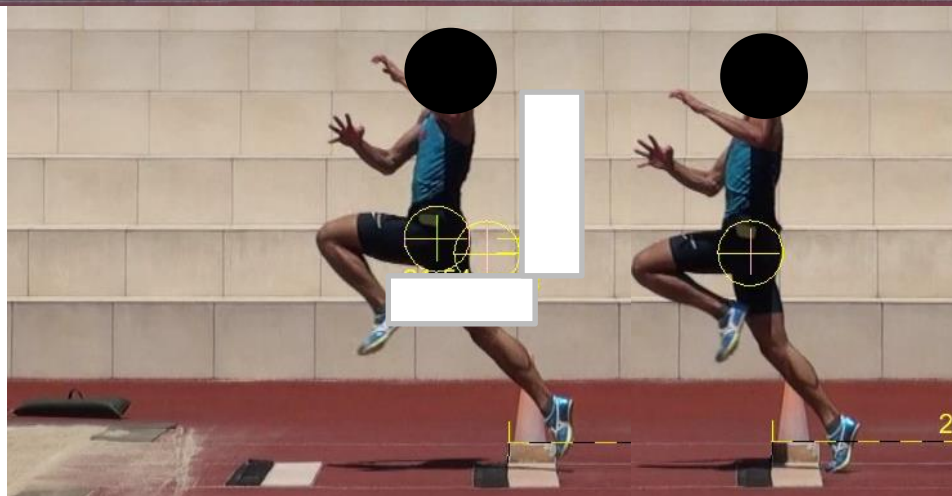
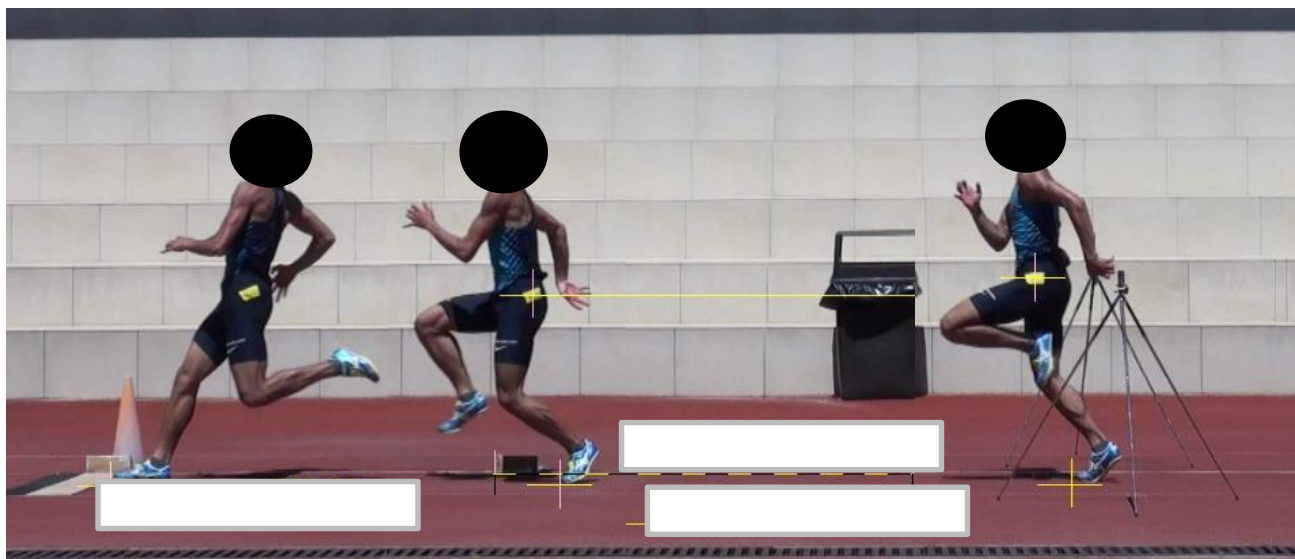




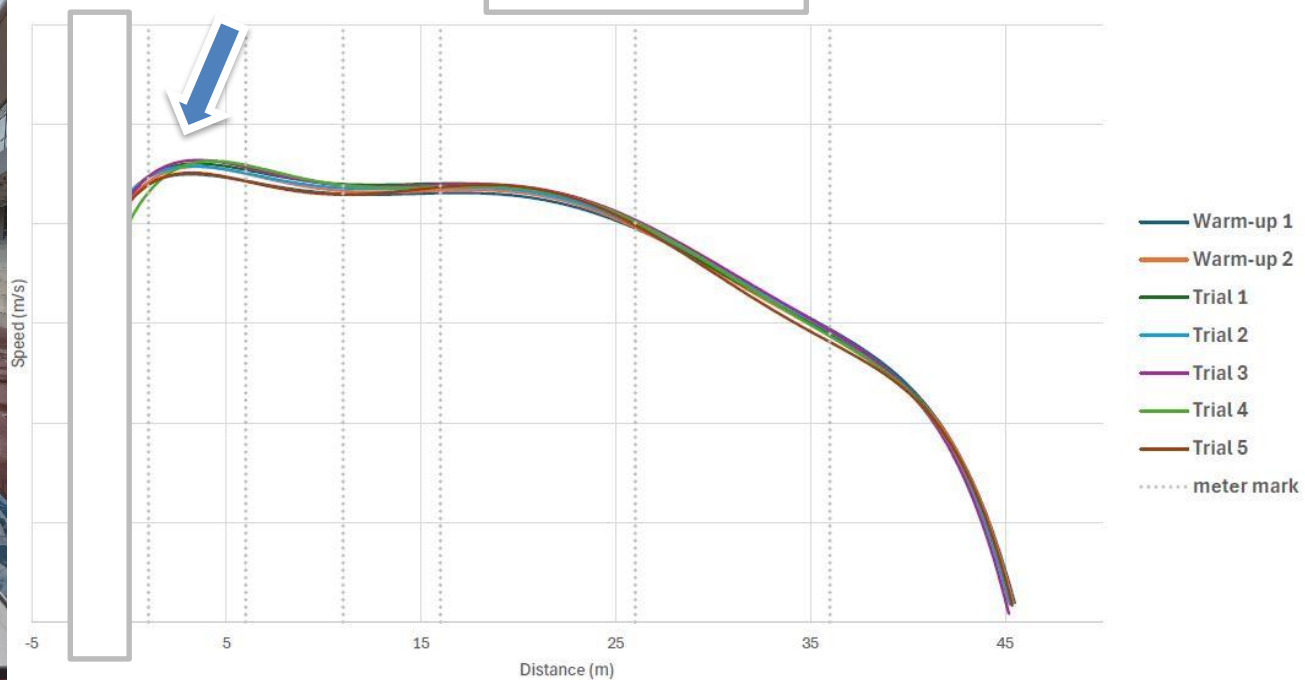
Athletics – Long Jump

- In training session





Max speed (m/s)
Max speed at Distance (m)

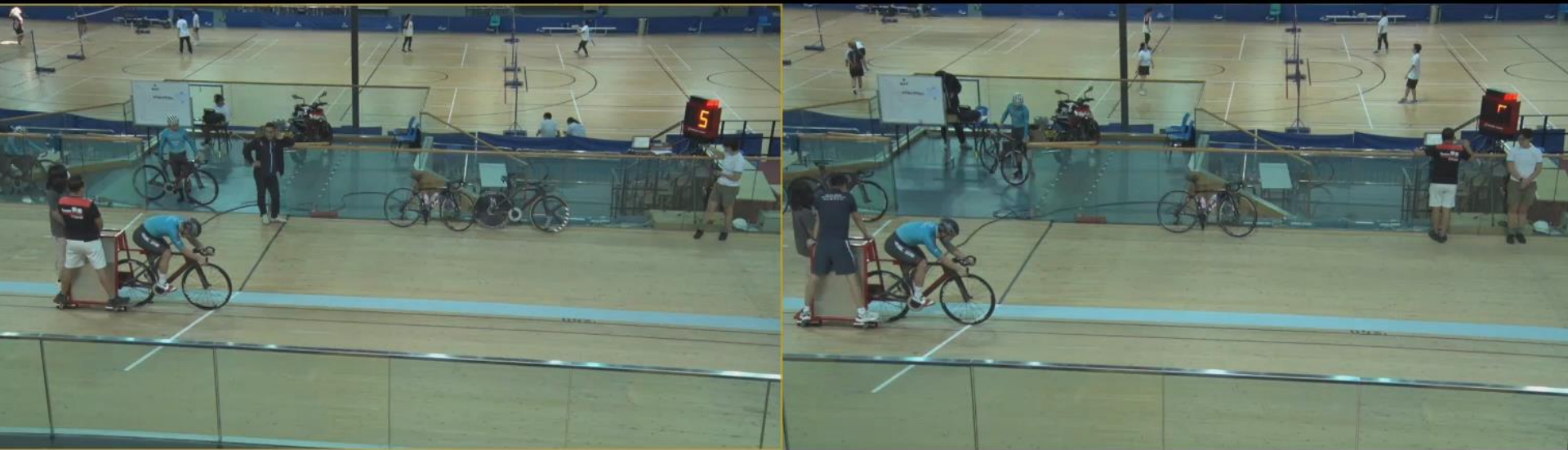


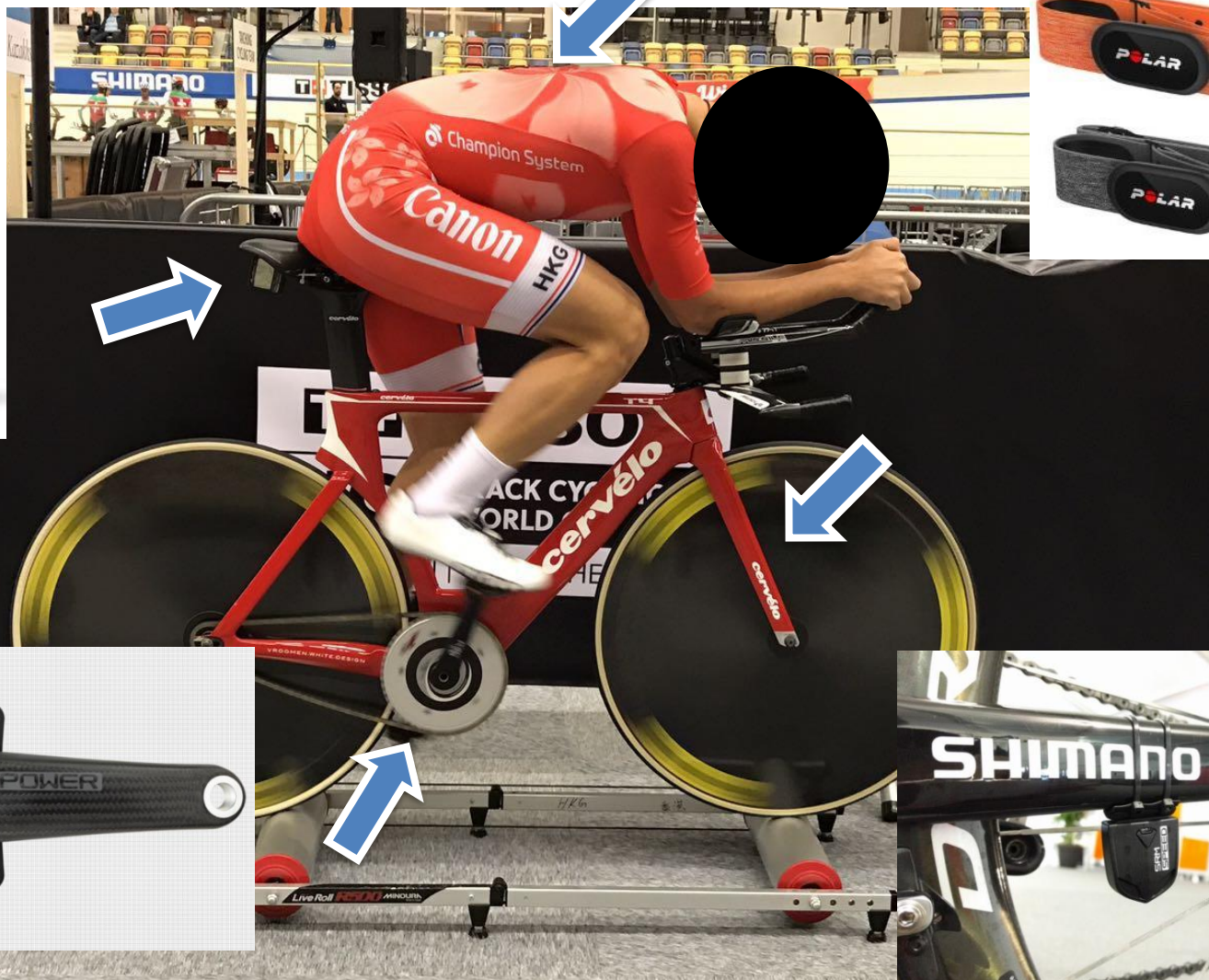
Board

Track Cycling

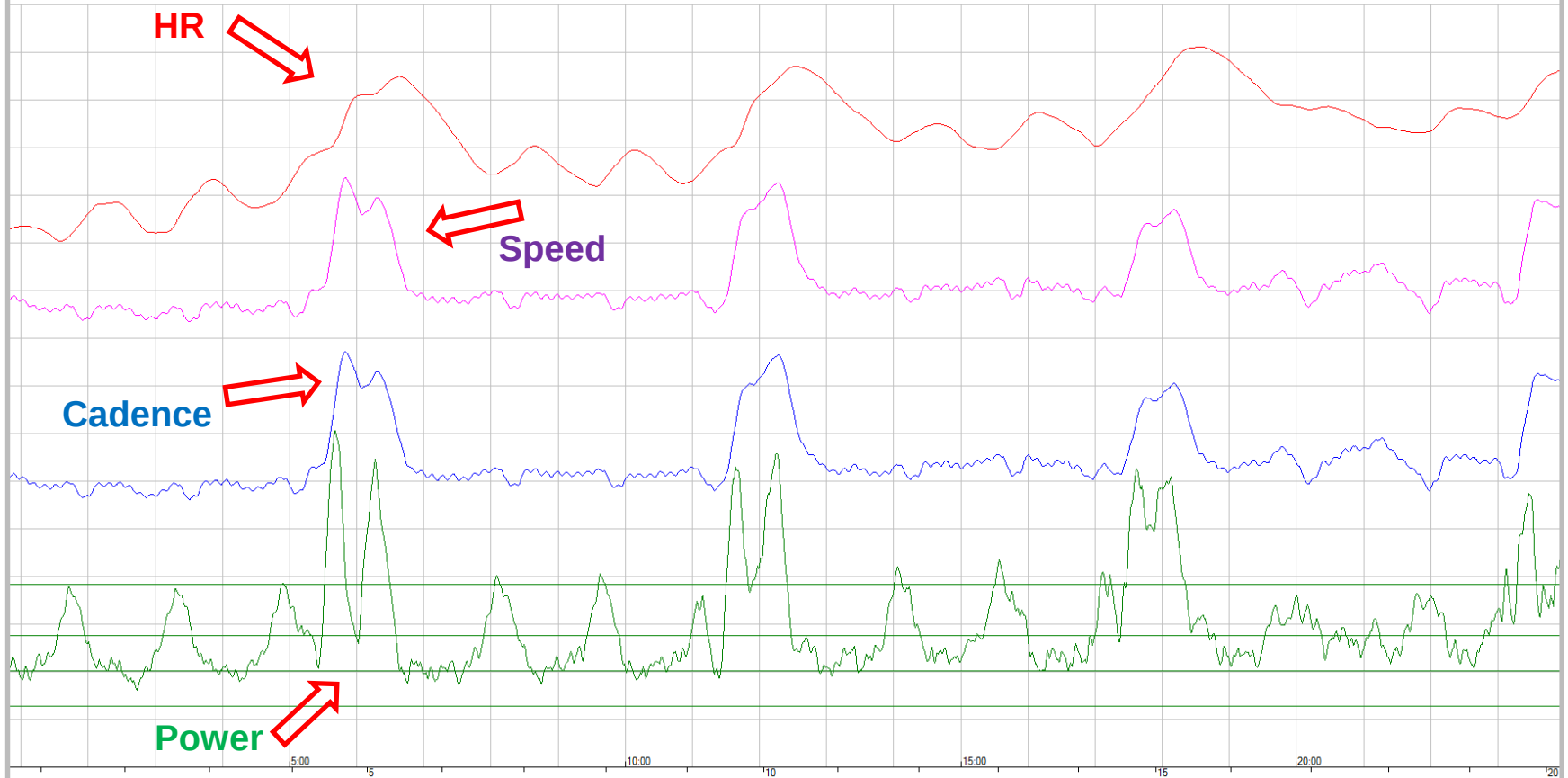


- Video clip syncing – standing start

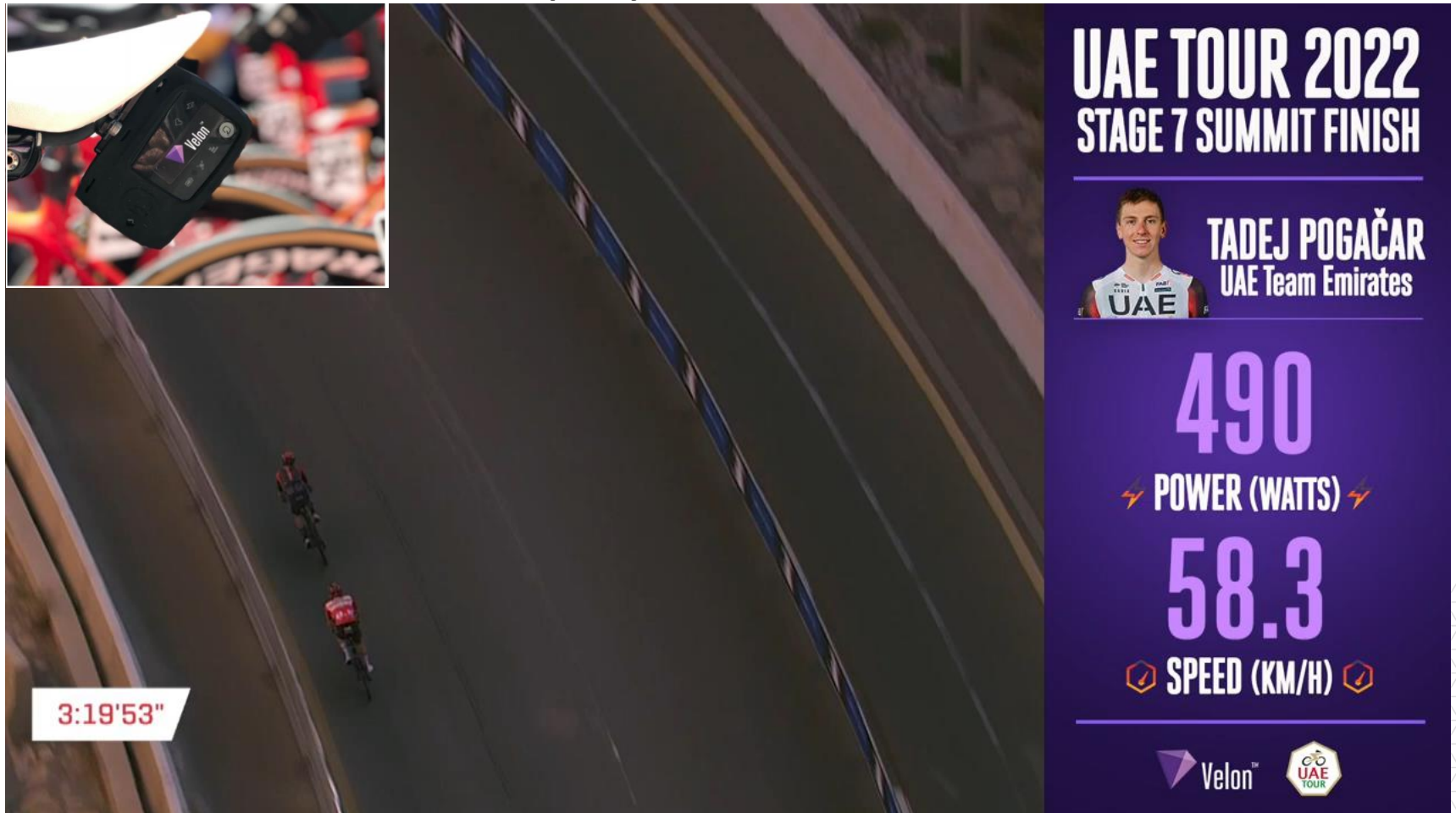




Power, Cadence, Speed and HR



- Real-time data display

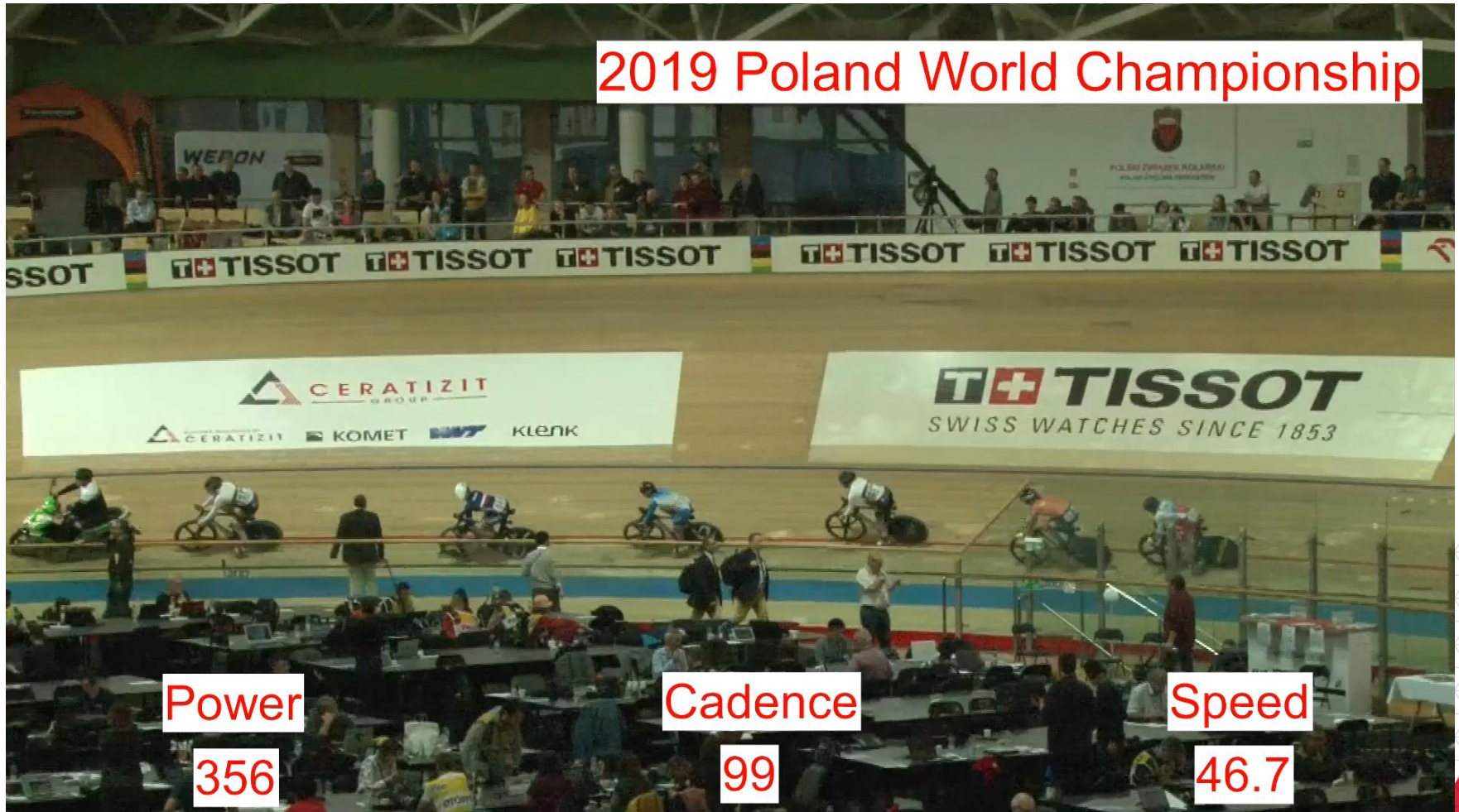






- Data combined video

2019 Poland World Championship

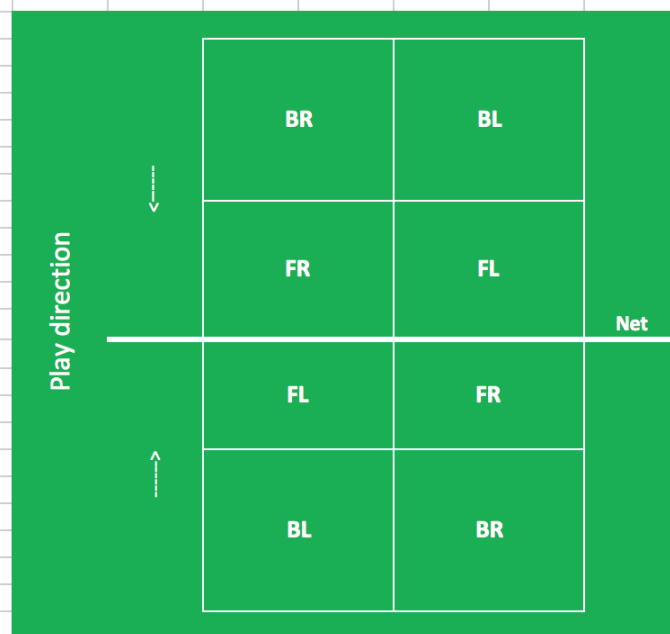


Game Analysis

Racket Sports

- Game analysis

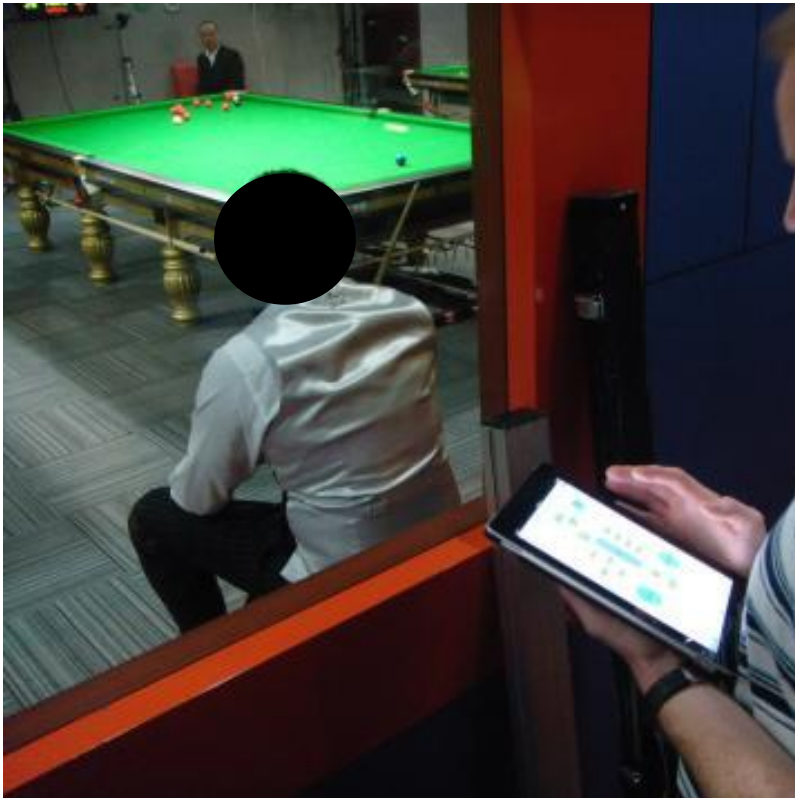
		Win										Loss									
		Direct					by opponent mistake					Direct					by own mistake				
	Win	Loss	FL	FR	BL	BR	Total	Out	Net	Serve Fault	Total	FL	FR	BL	BR	Total	Out	Net	Serve Fault	Total	
1st Game																					
2nd Game																					
3rd Game																					



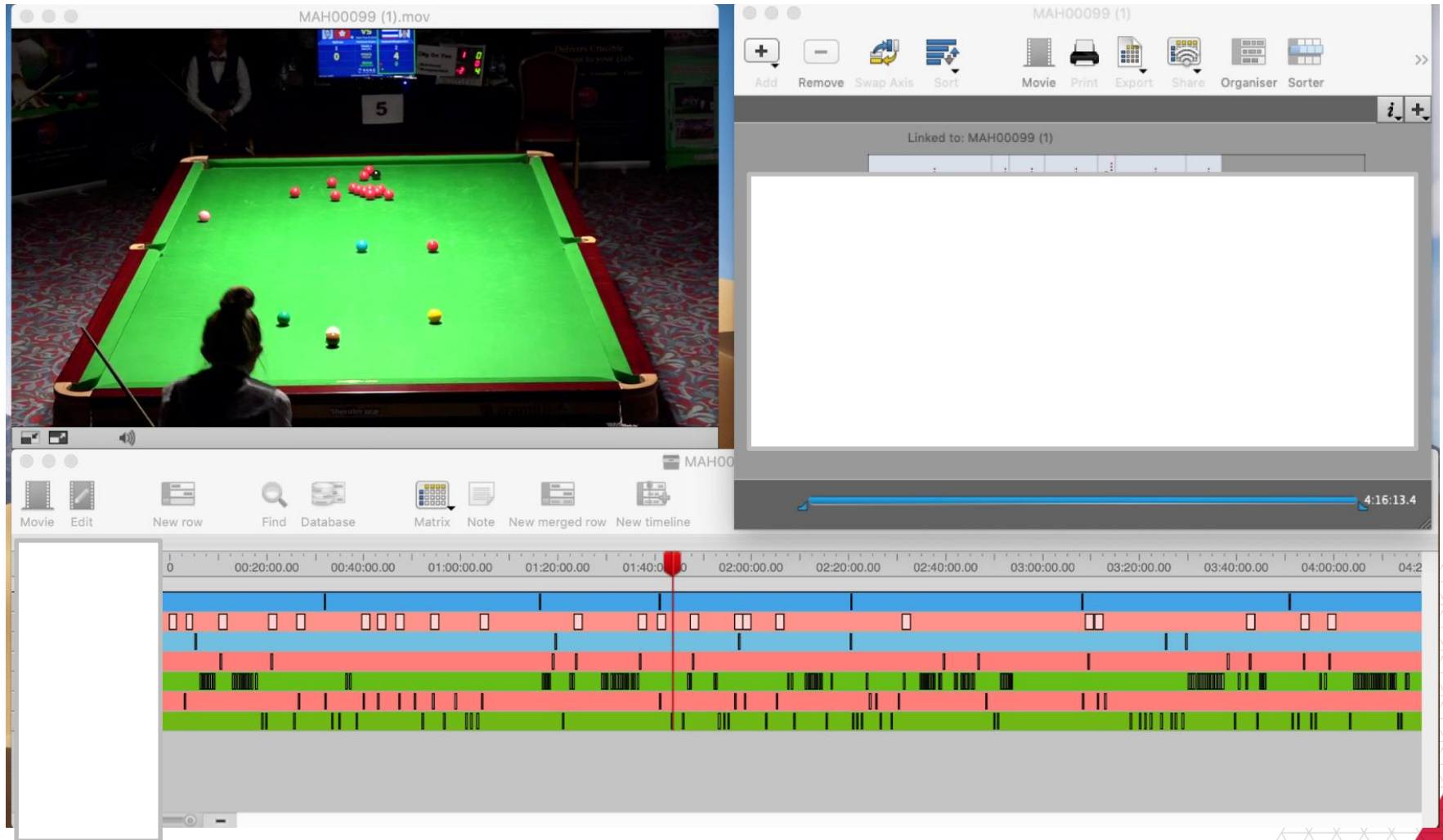
Win Direct = Win by Direct hit to the ground and no return
 Loss Direct = Loss by Direct hit on the ground and no return

FL = Front Left court area
 FR = Front Right court area
 BL = Back Left court area
 BR = Back Right left court area

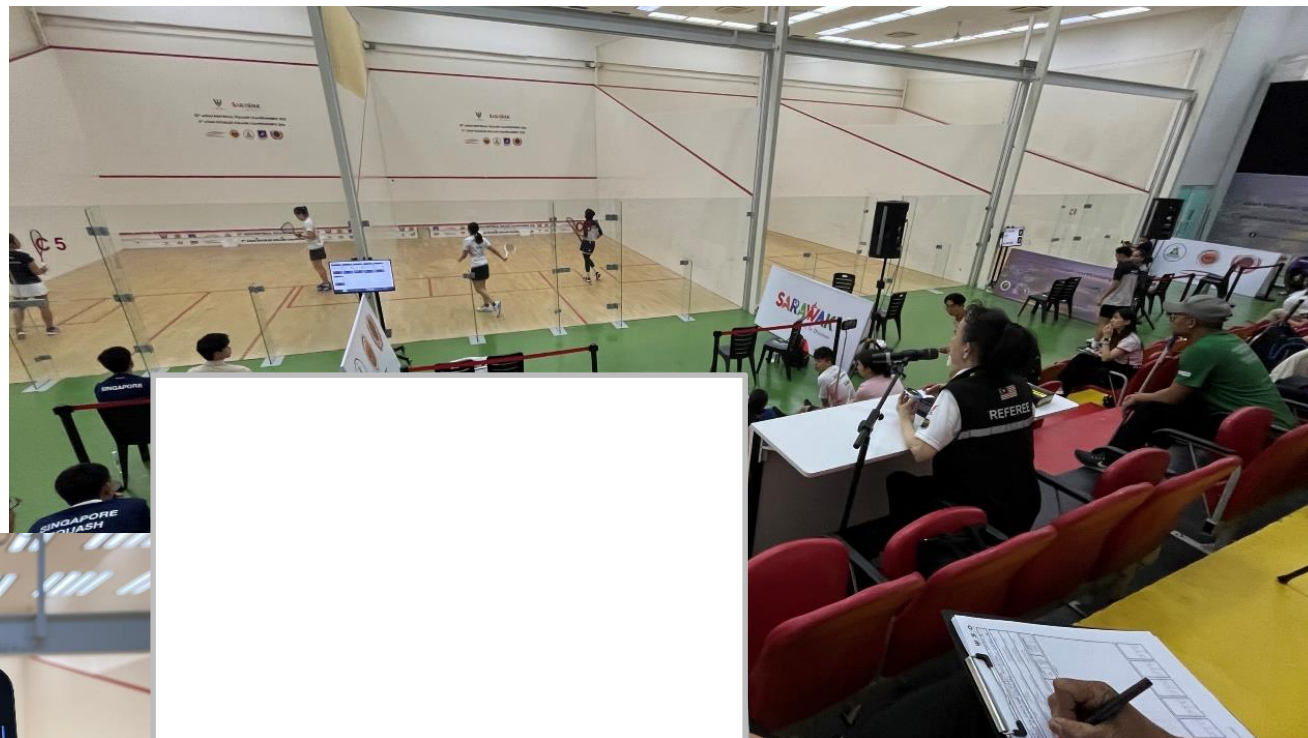
Billiard Sports



Billiard Sports



Squash







WSF WORLD DOUBLES MANCHESTER

Selby / Waters 0 1
Coll / King 0 2
Match Length: 2 mins

0:03 / 0:07

Counter Split - Decision
8s · 2:37 · 2017 WSF World Doubles Champs-Day5-XD-Final-ENG v NZ

Counter Split Decision
7s · 4:15 · 2017 WSF World Doubles Champ...

Clip at 6:32
7s · 6:31 · 2017 WSF World Doubles Champ...

Clip at 40:16
8s · 40:16 · 2017 WSF World Doubles Cham...

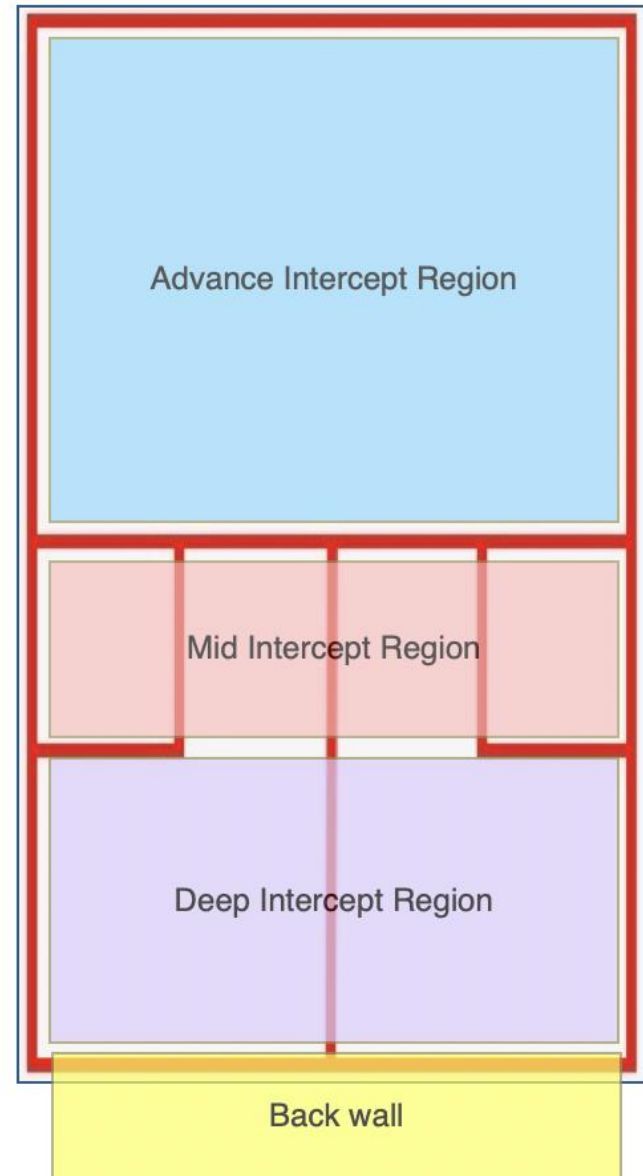
Where is the space?
10s · 40:54 · 2017 WSF World Doubles Cha...

Straight Drive to 'Strong...
7s · 1:44 · 2017 WSF World Doubles Champ...

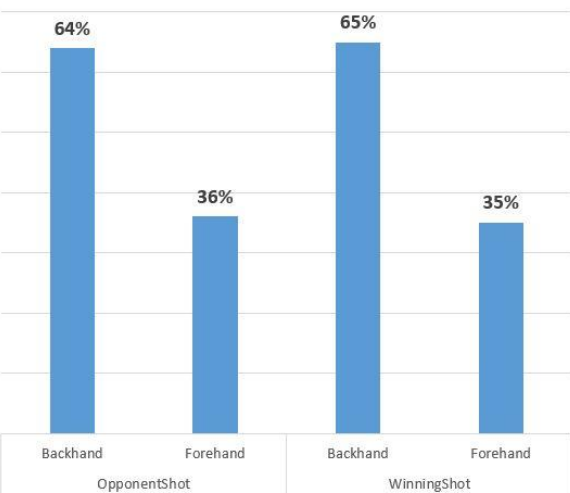
- Dropshot analysis
 - Backhand/Forehand
 - Intercept location
 - Good/Bad shot

Floor = Good

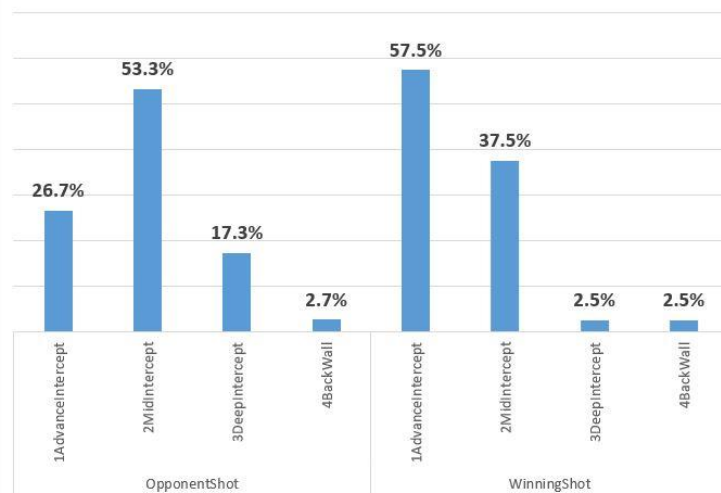
Side wall = Bad



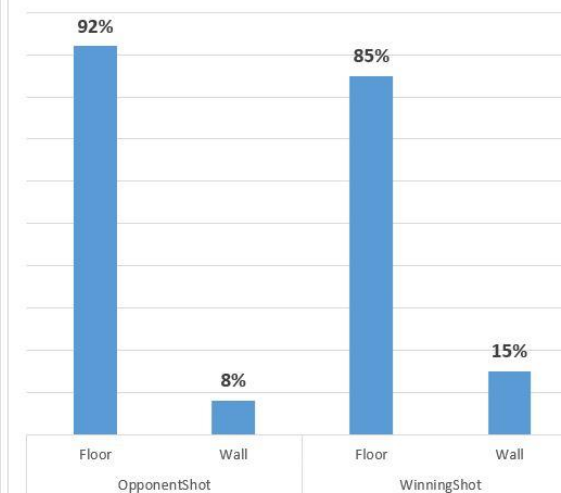
Backhand vs Forehand



Different locations



Wall vs Floor



Technology

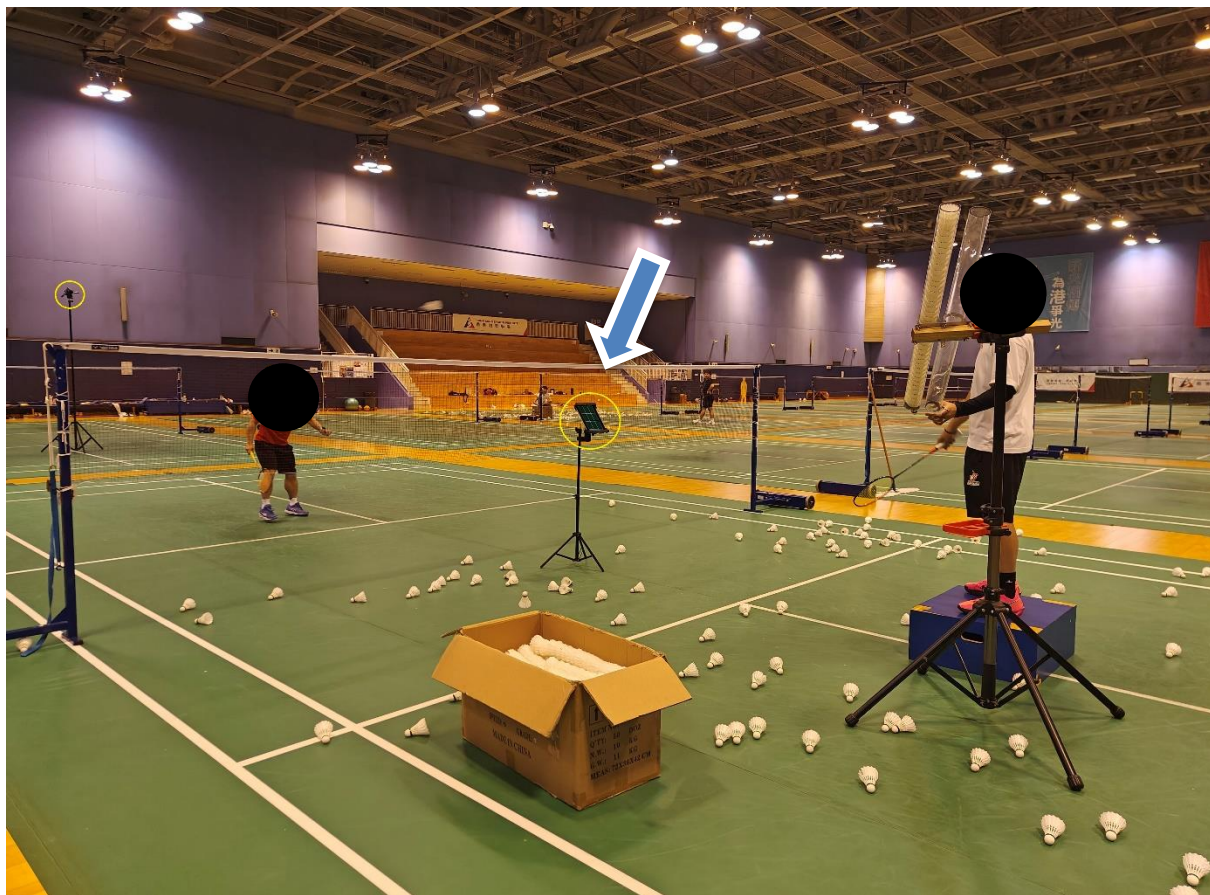
Para Badminton

(Video)

- Smartphone remote coaching
- Video, no. of stroke, racket swing acc. & HR
- Training load & Intensity

(Video)

- Tailor made Badminton goal frame
- Real time indicator feedback
- For trajectory control drilling



On-field Support & Testing

- Athletics
- Billiard Sport
- Badminton
- Cycling
- Squash
- Swimming
- Para badminton
- Para table tennis
- Wheelchair fencing
- Fencing
- Gymnastics
- Karate
- Sailing
- Triathlon
- Table tennis
- Windsurfing
- Boccia

THANK YOU!

michellen@hksi.org.hk