



# World Rowing Coaches Conference 2011

Review of Rowing Technology

By

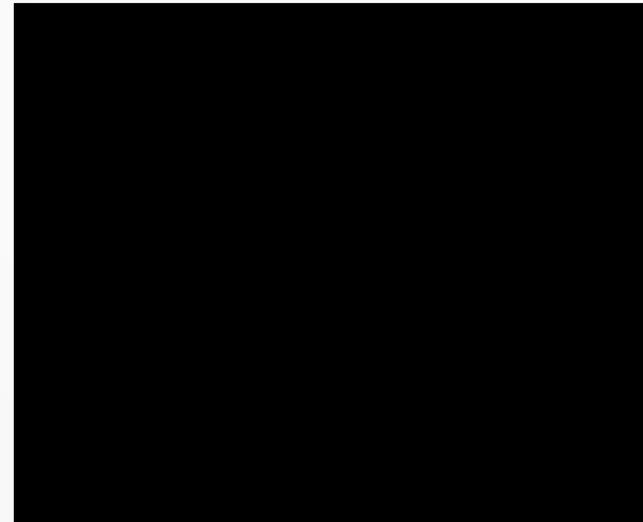
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# Outline of review

Two key areas which coaches and athletes use every day:

- Video
- Boat speed measuring tools.



# Objectives

## Video

- Better knowledge on what camera, computer & software could benefit your programme.

## Speed measurement tools

- Better knowledge on which boat speed measurement tool could benefit your programme.

# Skill acquisition

## Learning from video

- Feedback timing and type are important and have varying importance depending on the coaches aims & objectives.
- Video feedback has been proven to help athletes improve performance and learn how to produce movements better.
- Video can also act as a psychological enhancement tool for athletes to show pre & post technical improvements.
- Ultimately internal feedback is the best but all athletes need varying levels of external feedback to improve or even acknowledge an error.



# Video

'Normal'

High  
speed

Go Pro

Drift  
X170

Bullet

3D...!?!

# Video

- ‘Normal’ – still most important. Need to cater for evolving technology & sporting world i.e.
  - SD cards, Hard drive camera, DV tapes
  - HD quality or SD quality
  - Shutter speed importance
  - Mac OS or Windows OS computers.
  - Battery life
  - Size & weight
  - Sockets & ports
- UK = 25fps USA = 30fps

# Video

- High speed – Valuable for coaching & Biomechanics.
- 4,000 fps – Arrow flies around 60 m/s. For Rowing in my opinion 200fps is optimal, anything more than 1,000 is unnecessary.
- Resolution of image can get smaller with higher fps depending on quality of product.



# Video

- Go pro – [\(1\)](#), [\(Stern\)](#), [\(Bow\)](#). HD Hero recommended with suction for boat.



# Video

- [Drift X170](#) – 1.5” screen & remote control.



- Bullet – Great for land based biomechanics.

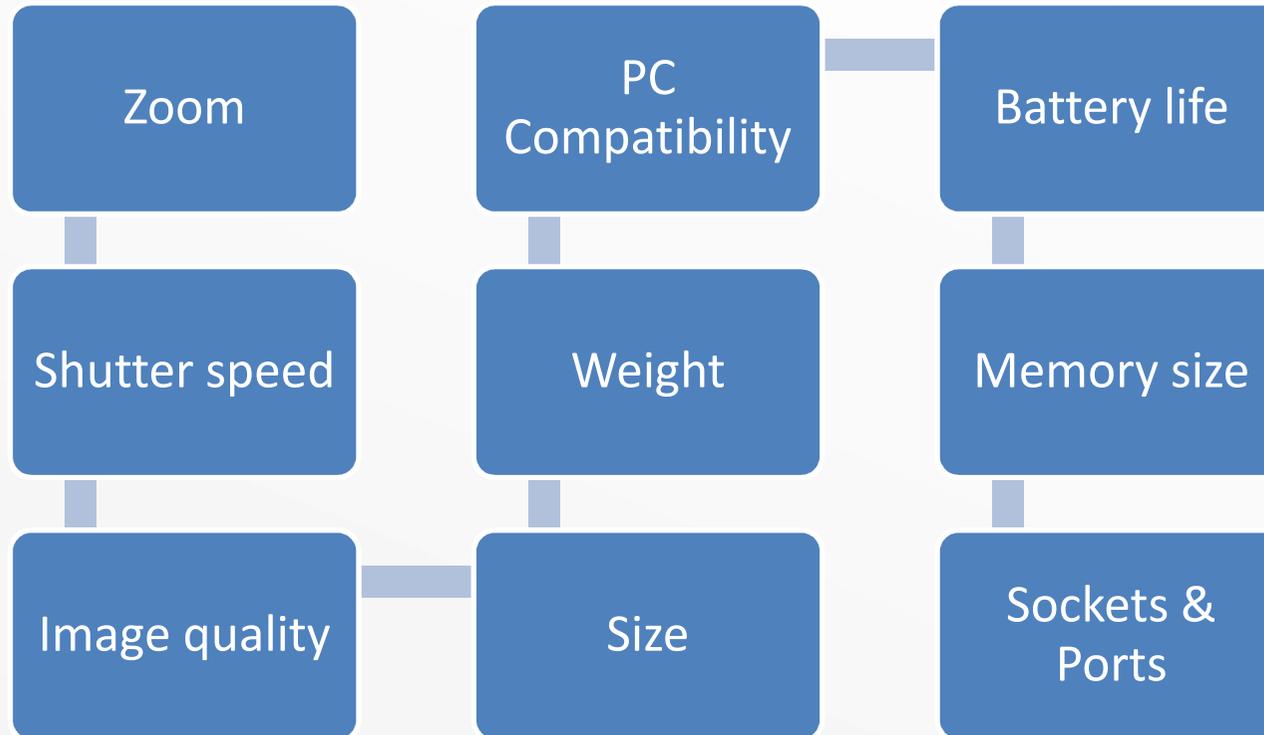


# Video

- 3D...!?! – Demo... Afraid no demo due to no 3D camera, 3D projector, 3D Glasses or 3D computer graphics card. Graphics card upgrades are available.
- No current sporting research on skill acquisition through 3D video.
  - There are some known 3D simulators



# Video Summary



***Do the basics well.***

# Speed measurement

- First and foremost...

“Speed measuring equipment made by rowers for rowers in my opinion is the most important factor.”

# Video

Stopwatch

NK

Coxmate

DigiTrainer

GPS 1Hz

GPS 10Hz

# Speed measurement

- Stopwatch – fundamental equipment but inexact.



# Speed measurement

- SpeedCoach gold – No HR or Transmission.



# Speed measurement

- SpeedCoach XL4 – Speed, Distance, SR, Time, HR, Stroke Count, Split & Transmission. Currently one of the ultimate tools for coach & athlete.



# Speed measurement

Impeller v GPS

Drag v Weight

Training v Competition

“Fit for purpose”

# Speed measurement

- GPS 1-10Hz – time, location of GPS unit, satellite location and orbital route of earth are recorded to produce a trilateration from the algorithms.
- Range from 1Hz upwards...
- Hz = recording frequency rate per second

# Speed measurement

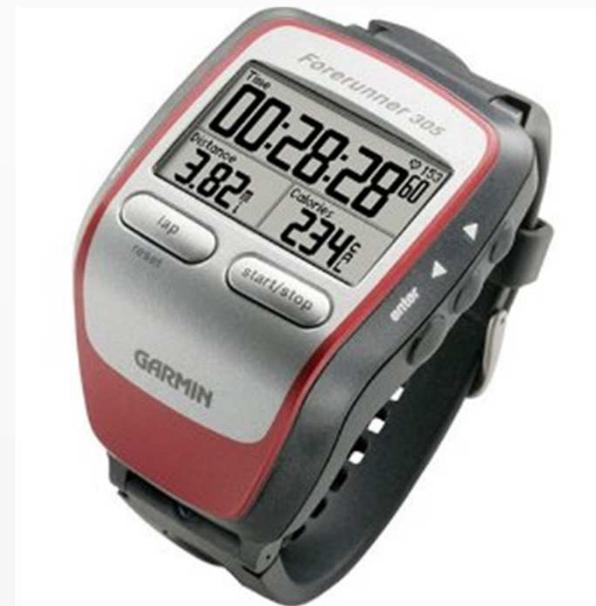
- Coxmate – Various products built specifically for rowers by rowers.



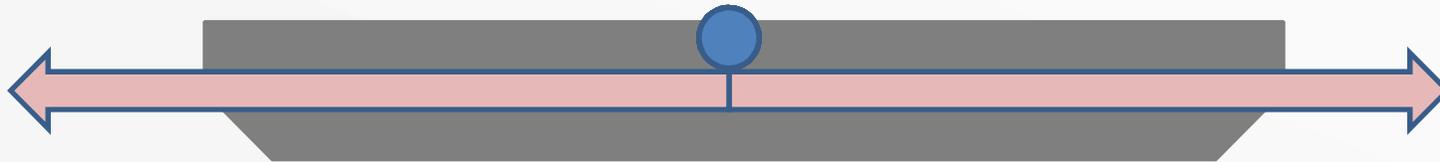
- Currently the coxless product is impeller based only.

# Speed measurement

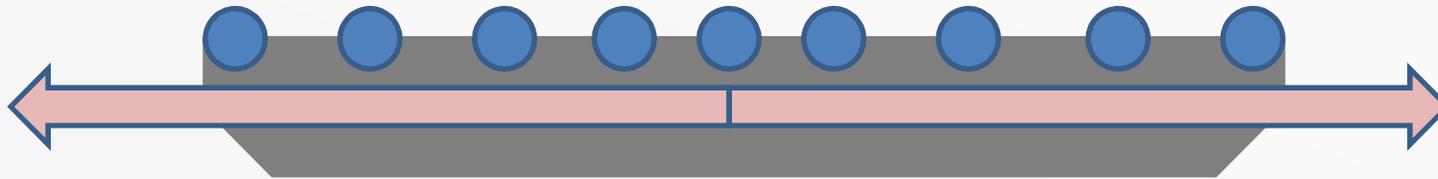
- Garmin Forerunner watch – 1Hz, simple to use, lacks detail for a rhythmic sport like rowing.
- Let me explain...



# What we want from GPS is...

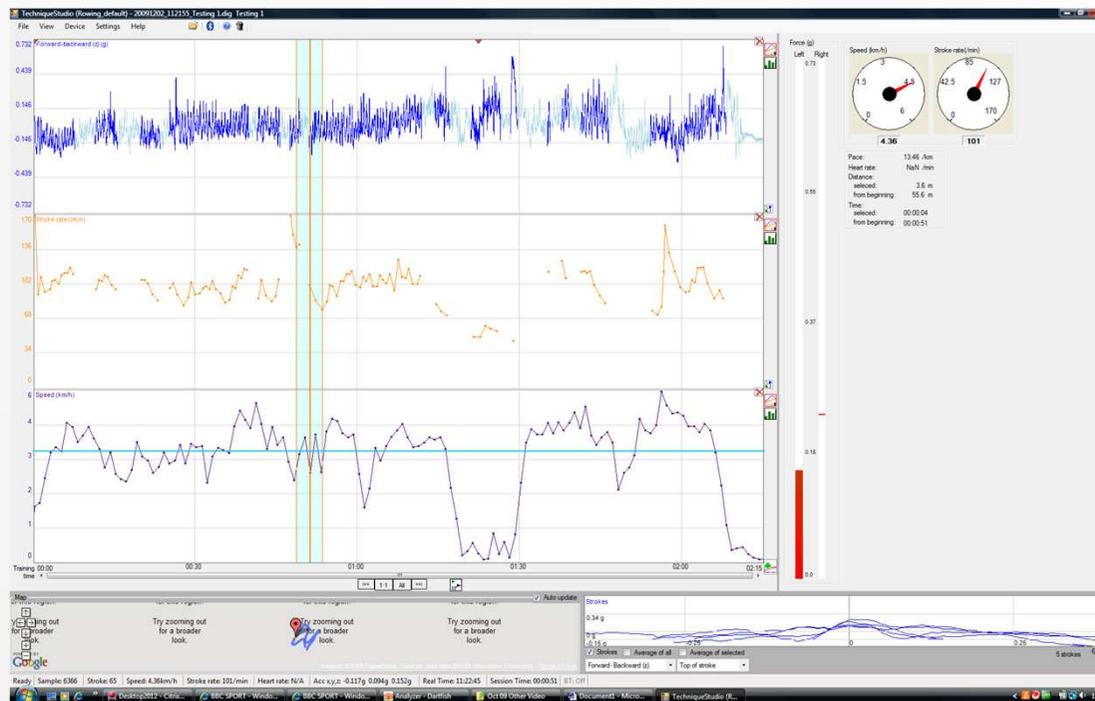


What we don't want from GPS is...



# Speed measurement

- DigiTrainer – 1Hz GPS, SR, HR, Bluetooth, screen. Built for Kayaking.



# Speed measurement

- [Brochure](#)
- Accelerometer
- Gyroscopes
- Magnetometer

# Speed measurement

- Catapult/GP Sports 2Hz – Similar issues to **Garmin** and only second hand now.
- Catapult/GP Sports 5Hz – 100Hz tri-axial accelerometers. Second hand only. Older 5Hz units are more like the new 10Hz units.



# Speed measurement

- Catapult/GP Sports 10Hz – Higher capture frequency more suited for Rowing. Plus Magnetometers, gyroscopes and wireless link.
- GP Sports 15Hz – Recently released.
- Higher Hz products constantly being released.

# Speed measurement



# Other Speed measurement products

- Video...?
- Video software:
  - Dartfish, Quintic, SportsCode (Mac), Focus x2, Silicon coach etc...
- Consult 'local' timing technology experts i.e. McLaren, Swiss Timing, Siemens etc etc

# Summary

## Video

- Do the basics well
- Advance technology with athletes skill acquisition ability.

## Speed measurement

- Budget dependant but the 'classics' are often the best solution.
- Data needs to be useable for coach & athlete.

# Thanks for listening

## Q & A

Any questions...?

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