Quintic Software

Tutorial 8a

Manual Digitisation

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1. Calibration

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2. Create Template

3. Digitisation

1 point manual & automatic digitisation is available in Quintic Coaching.

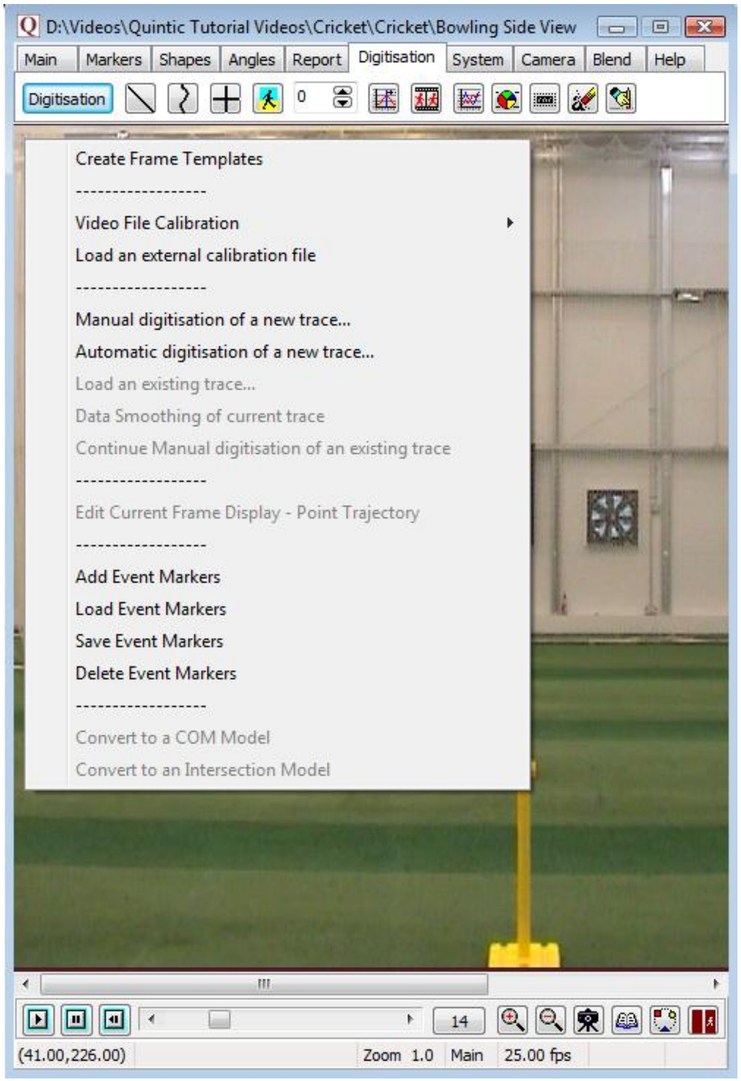
21 point manual and automatic digitisation is available in Quintic Biomechanics.

Digitisation allows you to track the location of certain parts of the body or pieces of equipment throughout the duration of a video clip. Quintic Biomechanics software can then calculate distances, velocities and accelerations of the points you have tracked.

GO TO RECAP ON QUESTION SHEET (PAGE 9)

Open the video **'Bowling – Side view'** from the **'Cricket'** folder.

Click on the **'Digitisation'** tab and then on the **'Digitisation'** menu.


D:\Videos\Quintic Tutorial Videos\Cricket\Cricket\Bowling Side View
Main
Markers
Shapes
Angles
Report
Digitisation
System
Camera
Blend
Help
Digitisation
0
Create Frame Templates

Video File Calibration
Load an external calibration file

Manual digitisation of a new trace...
Automatic digitisation of a new trace...
Load an existing trace...
Data Smoothing of current trace
Continue Manual digitisation of an existing trace

Edit Current Frame Display - Point Trajectory

Add Event Markers
Load Event Markers
Save Event Markers
Delete Event Markers

Convert to a COM Model
Convert to an Intersection Model
14
(41.00,226.00)
Zoom 1.0
Main
25.00 fps

1. Calibration

To begin digitised analysis, you must first calibrate the video clip. This means that the computer can then convert a distance on the computer screen to its relative distance in the real world. Video recording speed also needs to be set so that time based data (velocity acceleration can also be calculated accurately.

Either:

a) Select **'Video File Calibration'** from the drop down menu if you know the length of something that is part of the action (i.e. a javelin, cricket bat, leg length or stump height).

Choose one of the options presented:
- If you know certain distances in both the horizontal and vertical directions then choose **'Horizontal and Vertical Lines'**
- If only the horizontal distance is known then choose **'Horizontal Line only'**
- If only the vertical distance is known then choose **'Vertical Line only'**
- If a distance is known then choose **'Line in any Direction'**.

Hold the cursor over one end of the known distance, click the left mouse button and drag the cursor to the other end. Enter the distance and click **'Accept'**

Or

b) Select **'Load an external calibration file'** if you have used the same background and camera position as a previous video that has already been calibrated.

N.B. The camera must not have been moved between the filming of the two clips.

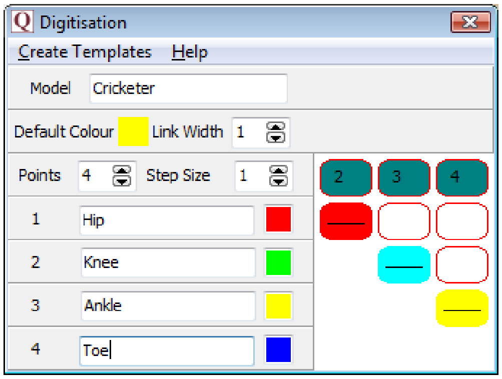
An accurate video recording speed is required to calculate accurate velocity and acceleration. Please make sure this is correct before using the linear analysis function.

GO TO QUESTION 1, 2, 3, AND 4 ON QUESTION SHEET (PAGES 10 - 11)

2. Create a Frame Template

N.B. Only one point is available in Quintic Coaching. The following template has been created in Quintic Biomechanics.

From the **‘Digitisation’** menu click ‘**Create Frame Template**’.



Model Cricketer

Link Width 1

Points 4 Step Size 1

1 Hip

2 Knee

3 Ankle

4 Toe

Model: Name your model so that in the future you can use it again. Call it **‘Cricketer’**

Points: Select the number of places you are going to track in the movement. We are going to do 4. (If using Coaching the maximum amount of points you can select is 1)

Step Size: This states how many frames will be digitised (1 = every frame, 5 = every 5th frame etc). We will be doing every frame so choose **‘1’**.

Link Width: This is the width of the lines that join up the points. We want a very thin line so choose **‘1’**.

Point Name: You can change the names from **‘point 1’**, **‘point 2’** etc to specific names. We are going to track the joints of a leg so call your points ‘Hip’, ‘Knee’, ‘Ankle’ and ‘Toe’.

Default colour: Left click on the coloured box next to **‘Default colour’** and select a colour from the palate. Now left click on the box next to the point names to transfer that colour. Follow the same procedure for all 4 points giving them different colours so they can be identified later in the analysis stage.

Link colours: Change the default colours and click on the boxes as in the example above. To remove the colours from one of those squares, right click on it. These boxes show which points will be connected to each other. We want to connect 1 to 2, 2 to 3 and 3 to 4; so we have put different colours in the boxes that are at the cross-points.

Click **‘Create template’** on the top-left of this window and click **‘Save As’**. Call it **‘Bowler leg – 4 point’** and save it in the ‘**Cricket**’ folder.

N.B. This will replace any previous traces called by the same name.

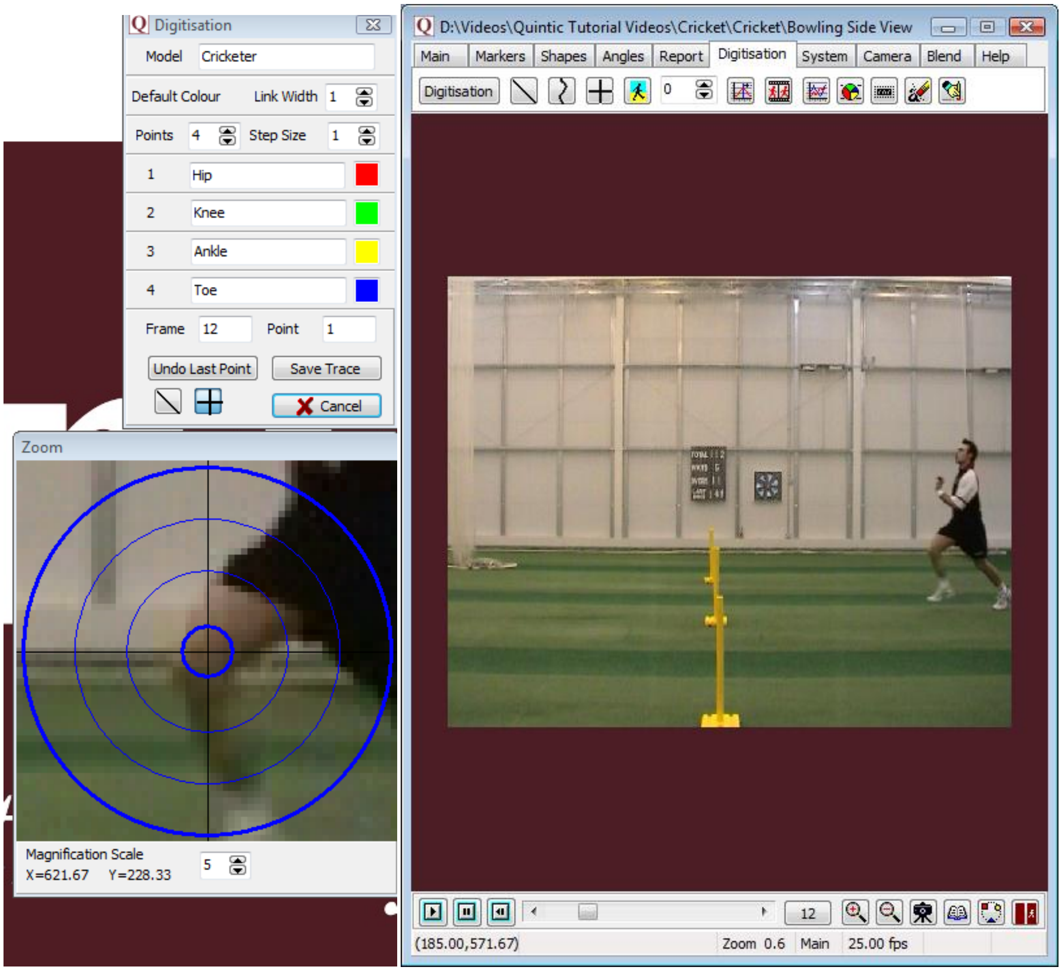
3. Digitisation

In the Main window click on **'Digitisation'** menu and then click on **'Manual Digitisation of a New Trace…'**

A window may pop-up asking if you want to overwrite the existing trace... Click '**Yes**'.

Navigate to the cricket folder and open '**Bowler leg – 4 point'** template.

We are going to digitise the left leg of the bowler so scroll to the first frame in which their whole left leg is visible (Frame 12). Now we are ready to digitise.


Digitisation
Undo Last Point
Save Trace
Cancel
Zoom
Main
Markers
Shapes
Angles
Report
Digitisation
System
Camera
Blend
Help
Digitisation

Model Cricketer

Default Colour Link Width 1

Points 4 Step Size 1

1	Hip	🟥
2	Knee	🟩
3	Ankle	🟨
4	Toe	🟦

Frame 12 Point 1

Magnification Scale 5

X=621.67 Y=228.33

D:\Videos\Quintic Tutorial Videos\Cricket\Cricket\Bowling Side View

12

(185.00,571.67) Zoom 0.6 Main 25.00 fps

As the cursor moves across the screen, the zoom window shows a larger version of the area under the cursor. Use this to pinpoint the exact locations of the hip, knee, ankle and toe.

This must be done in the correct order and as accurately as possible.

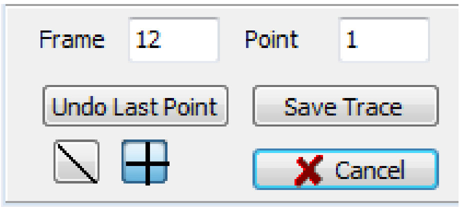
If you make a mistake, click the **‘undo last point’** button. After you have clicked on all 4 points a window will state, **‘Frame completed. Accept Frame?’** If you have made a mistake on the final point click **‘No’** and re digitise that point. If they are correct, click **‘Yes’** and the video will automatically advance to the next frame ready for digitisation.

The following buttons can be used to change how the trace is viewed during digitisation:

⧅ - Show/hide figure trace

⊞ - Show/hide crosses

Continue to digitise until the bowler moves off the screen or until you do not wish to digitise any further then click **‘Save Trace’**.


Frame 12
Point 1

GO TO QUESTION 5 & 6 ON THE QUESTION SHEET (PAGE 12 - 13)

Question Sheet

Recap

1) When capturing video footage what are the Trim In and Trim Out functions?

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2) What is the maximum duration you should capture in one go?
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3) What is the name of the piece (hardware) that links the video camera to the computer?
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4) What is the difference between capturing at **'Half'** and **'Full' s**ize?
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BACK TO TUTORIAL SHEET (PAGE 3)

Using the video **‘Bowling – Side View’** from the **‘Cricket’** folder

1) Calibrate the video by assuming that the bowler’s right forearm (elbow to wrist) is 0.3 metres long (draw vertical line in frame 19) and the base of the middle set of stumps is 0.2m wide (draw horizontal line).

2) Calibration measures the distance between 2 points on the video and relating this to the real life distance. Distances on a video are measured in **‘Digitising Points’** (dp), which is the number of coordinate points it covers in the horizontal and vertical directions.

   (i) Which letter represents coordinate measurements in the horizontal direction?

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   (ii) Which letter represents coordinate measurements in the vertical direction?

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3) A scale is created which tells you how many metres are represented by 1 digitising point.

   (i) Use the scale 1dp = 0.1 metres to calculate the real lengths of these objects

Object	**Lengths on video (dp)**	**Real lengths (m)**
Example: Rugby ball length	*3*	
Cricket bat	9	
Rugby player’s shoulder width	4	
Football goal width	70	
Netball post height	30.5	
Cyclist’s lower leg	3.5	
Hockey stick	10	

(ii) Can you use the scale 5**dp = 0.1metres** to calculate the real lengths of these objects. *(Hint: it may help to change this scale to work out how many metres are represented by 1 digitising point.)*

Object (NO VIDEOS REQUIRED)	**Lengths on video (dp)**	**Real lengths (m)**
Example: Ballet shoe	*4*	*0.20*
Long jump pit	105	
Diving platform height	150	
Tennis ball	1.5	
Basketball Net diameter	6.75	
Javelin length	15	
Trampolinist's hip width	6	

4) Can you calculate the scale when given the lengths on video and in real life in these examples? This time calculate the scale by working out how many digitisation points represent 1 metre – '1m = ?? dp'

Object (NO VIDEOS REQUIRED)	**Lengths on video (dp)**	**Real lengths (m)**	**Scale**
Example: long jump	*180*	*6*	*1m: 30dp*
Diving board length	50	5	
Volleyball net height	300	3	
Cricket stump	20	1	
Kayak paddle	50	2.5	
Rowing oar	70	3.5	
Squash racket	125	1.5	

BACK TO TUTORIAL SHEET (PAGE 6)

5) Imagine you have digitised video clips of two different swimmers performing the same stroke. Explain why it is important to calibrate both clips in order to compare the speeds of the two swimmers.

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Open the video **‘Sprint _Start_side_on’** from the **‘Athletics’** folder.

6) You are going to digitise one complete cycle of the runner’s left leg.

(i) At which frames are you going to start and finish your digitisation? Justify your answer.

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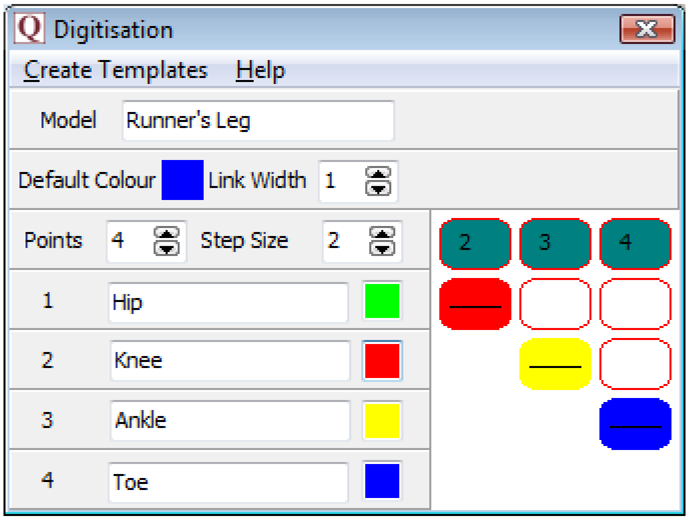
(ii) Create this template for your digitisation. (If you are using Quintic Coaching create a 1 point template and trace a point of your choice).



Model Runner's Leg

Default Colour 🟦 Link Width 1

Points 4 Step Size 2

1 Hip 🟩

2 Knee 🟥

3 Ankle 🟨

4 Toe 🟦

(iii) Why can’t you continue to digitise after frame 65?

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(iv) Which point do you think will show the greatest peak values of Horizontal Velocity – hip, knee, ankle or toe? Explain your answer.

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(v) Which point will show the lowest peak values of Horizontal Velocity throughout the stride – hip, knee, ankle or toe?
Explain your answer.

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