

Exercise & Sports Biomechanics
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Week 03
Lecture 15
Dartfish (Contd.)

[Hello, everyone! Welcome back to this course. In this video, we will explore different qualitative analysis tools using Dartfish software].

In the previous video, we explored both the library and edit modules. Now, we will look into the next **module called In the Action**.

For that, go to Tools and press the In the Action button. A new window will open in addition to the five modules we have discussed before. The In the Action module is one of the most powerful tools for coaches and sports scientists to provide immediate feedback, which means the athletes will be recorded live, and the feedback will be given immediately after the training or after performing any action. The first step is to select the camera source. In this module, Dartfish is capable of recording from four live cameras. At the top, there is an option called Network Cameras. If you have any kind of IP cameras connected, this is the way.

The second option is to search for the cameras. On the left side, next to the active sources, there are a few cameras already listed that are connected to my laptop. So, I can choose either one to make it the active source. For that, you need to click the plus icon. Once you click it, the video will be immediately active. On the right-hand side, you can see the name of the camera, the exact video source, and the format. Once you click that, you can change the image size. I will choose the full HD format and set the frame rate to 30, then press OK. There is an option to activate the audio, but my audio and the system audio will not sync. Even now, you can notice that my audio is not synced with the video you are seeing in the action volume.

In addition, you can choose where the video needs to be recorded, and the most important thing is you can see the remaining space available in the laptop. Here, it is showing 66 GB, so I can record 10 hours of live video. Once this is done, press the close button. Now, you are ready to record the live video. Before recording, let us explore the different tools available here. The first one is the source where Right now, you have connected the video camera. There is a small icon like a camera. It is showing that the device is streaming okay. If the device is not streaming, it will show a cross symbol. So, it is very clear for the analyst whether the camera has any issues or not.

The next one is the session.

Here you have the three different options. The first one is to keep the entire recording. For example, if you are going live for more than one hour or two hours, the entire video will be recorded. The second option is to keep the events only, which means there are four different events. We can choose the four events.

And after the completion of the recording, only those events will be saved. The remaining videos will be discarded. And the last option is to delete the recording. Once you are recording the video, there will be a provision to add the videos to the montage. If you do not convert the video into a montage, you will not be able to save any kind of videos in this option.

The next one is the settings here, It is asking for the session file name. I will give NPTEL, and you can see the encoding format of the video, which is MP4. If you want to create a new montage, where you can connect all the videos and images in one place.

And you can choose which format you want. So, currently, I will keep the entire recording for this educational purpose. And then press Apply. You can change the name to NPTEL.

Now, let us start the recording.

Currently, you are in the live mode, which is indicated by the yellow color. And the next option at the diagonal bottom is the blank. If I do not want to show the video live, if I press blank, it will go black. You will not be able to see my video. Again, if I press the video live, you will be able to visualize it immediately.

Next, we move on to **live delay**.

Currently, you are able to see this pen live. Once I press the live delay, it may appear, but it will come on delay. In the live mode, if I am showing 4, 3, 2, 1 and then if I press the live delay, it may take 10 seconds. Right now, you are able to see all the numbers that I showed before. I will stop the recording. And you can go to the settings button. **There is an option called live delay**. Here you are able to see the delay duration of 10 seconds. I can set a maximum of 120 seconds for live delay. Here you can see a total of 120 seconds live delay. If I go to the settings again, even if I give values more than 120, it will show the maximum value of 120 seconds.

Next, we move on to the **Events**.

At the bottom of the screen, you can see the four event buttons. Now, we will go to the settings and select the events. You can see the four different events named start, end, success, and danger. If you wish, you can change the event button. I will change it to good and bad. And then press apply. If you notice, there is a change in the event name on the screen.

I will go to the settings again. In the live delay, there is another option called Preroll of 2 seconds, and the duration is 7 seconds. Which means, as soon as I press the event, it will record 2 seconds prior and 5 seconds of the actual event, which is a total of 7 seconds. I can reduce it to 5 seconds total, among which 3 seconds will be the event and 2 seconds will be prior to the event. If I press the option variable here, there is no end duration mentioned, which means as soon as you click the event. It will start 2 seconds prior, but you have to stop the video manually.

So, I will change it to 5 seconds and then press apply. If I start the recording now, you will be able to see all these 4 events are live. For example, if I am showing this pen and then

clicking on this good event, On the left-hand side, you will be able to see the event which is mentioned. Now you are seeing the recorded video of that pen which is highlighted as a replay here.

If I want to switch back to live again, I can press the button. If I am showing my mobile and then if I am selecting the event pad in the video, you can notice that the event is created. Now, you are again watching the replay video. The **advantage in the action module** is even when I am showing the replay video, at the top you can notice that the video is still recording live.

That is the power of the **action module**. Currently, you are in live, and when you press the button play session, It will highlight all the events which we have recorded in this session. We have recorded two events, one is good and one is bad. If you wish to add this specific event to the montage, you can select and press the button add to montage, and there is an option called montage.

Here, you can see the video. Once you add all the videos and images, As we discussed before, you can export and share the video with the coaches and athletes. The **advantage of the interaction module** is that even when you are live, you can calibrate the video. You can provide the stopwatch, draw the lines, and explain in the live video.

Why is it so important?

Because as soon as the athlete performs any action, the feedback must be given immediately. If it is delayed, the purpose of giving the feedback will not be served. The focus should be on immediate feedback.

Next, we move on to **SimulCam**.

Go to Tools and click on SimulCam. A new window will pop up in addition to the File module. Previously, we explored basic comparison videos in the Edit module. It is very hard to compare the video if you zoom in, zoom out, and pan the video simultaneously. That is why the Simulcam was introduced.

Simulcam is a powerful tool in Dartfish, which lets you compare and overlay two videos. This means you can watch both videos at the same time and see the differences. It is best for checking movement and analyzing the technique when both videos are recorded from the same angle.

The **advantage of SimulCam** is that it will identify the background pixels and match the background. For example, if I am recording a specific technique from this competition and if I want to compare the video from the previous competition, then SimulCam is not the best solution. Which means, if you are shooting one video from a different perspective, and another video from a different perspective, SimulCam is not the right option.

In this situation, you can use the edit module in Dartfish. This will help you compare the videos separately without forcing them to fit in the same frame. The SimulCam is designed to analyze minute differences in technique which help us to identify small changes when executing a movement before and after training. And this is especially beneficial for

technique analysis in sports like archery, sprinting, and weightlifting. On the left side, the blue color is the reference video. And on the right side, the yellow color is the second video for comparison.

The software takes the first video as a reference and aligns the second video accordingly. The **next step is to sync the video**. Before that, you need to understand the sliding bar at the bottom of this simulcam. It is exactly similar to the library module or the edit module, where you would have used the jog wheel. Similarly, we are going to slide this bar to move the video.

You can see the flag at the top, and if you look into the video very carefully, the archer has already initiated the drawing movement from the beginning. So, I will set this as a cue in, and I will move the video forward. You can understand the different phases of archery.

The first one is the drawing phase. The second one is the aim phase, where the archer will hold for some time and then release it. You can notice the follow-through on the right hand. So, we will take the entire clip from the drawing position till the follow-through. We will make this point as the cue out.

Now, we will repeat the same thing for the second video.

I am moving the flag to the initial position. Now, select the yellow slide bar. You can notice that in the second video, the archer is bringing the bow down. Wait for the drawing movement to initiate exactly here. Once the video is synced, Press the next button. Here, you need to cross-check all three different images. In step two, it is clearly written to drag and zoom to align the background in each of the three combined images. So, I will zoom in and zoom out. In this example, I have placed the camera at the top view. You can see two different tripods. If you look at the human, there will be variability. Humans are constrained by variability.

So, do not focus on the human. Rather, check the static objects like the tripod. If I zoom in, you can see the two different tripods. So, we need to make sure we have a single tripod. The static objects should be single. Once everything is done, check the second image and notice if there are any two images; then we have to zoom in and zoom out.

And finally, the last one looks very clear; then press next. In this window, you need to choose, which type of blending mode is required for your video. For example, if your background is constant, then you can choose the option constant. If your background is very light and you cannot predict the background, then you can choose the color-based. Finally, in the background, if someone is moving or the object is moving, then use the motion-based. So, in this example, I will use the constant blending mode and then press the button start preview. During the preview, you can see how well the video is synced.

From the biomechanical perspective, I can see the entire drawing technique is almost the same. Now, it is the aim position. They are maintaining the same aim position. You can notice that one video is released earlier than the other one. Which means, in one video, the person is holding the aim for too long when compared to the other one.

In accuracy sports, even a minute change can significantly alter the result. This information will help coaches and athletes understand what exactly is happening between the two videos. From the best performance to the worst performance. Once everything is done, press the Publish button. The video will save in MP4 format, then it will ask where to save the video, change the name, and then press Next. The video is successfully published. Press the Close button. You can notice that the video is immediately downloaded and reflected in the tray. As discussed before, this video can be played in the edit module.

[You can share this video with athletes and coaches in multiple formats].

[So, thank you, and see you in the next video].