Dr Lyndell Bruce from RMIT University shared with me how she has used video analysis software in her previous role as a performance analyst for Netball Australia when she was based at the Australian Institute of Sport.

Lyndell used ‘Pattern Plotter’, a game analysis tool using video and live coding. It enables coaches to provide feedback to players about how closely their performance matched the pre-game strategies, by plotting the path of the ball and coding what occurs where the ball is located at each point in time during the game.

The primary purpose of software such as Pattern Plotter is to provide team analysis within a game setting. This is different to a more technique based analysis of movement that is individualised by using frame-by-frame analysis of a specific movement to improve technique based on for example: trajectories, speed, distance or to compare with an ideal performance by overlaying it or using synchronised side-by-side analysis.
One of the special features of Pattern Plotter is that it provides both spatial (allows the path of the ball to be plotted) and temporal (events are linked to specific parts of the actual video footage) mapping. The spatial mapping (similar to an animation of the ball path or individual player movements with time references), enables you to quickly, as the name of the software suggests, see patterns such as multiple turn-overs in a specific location of the court or stepping within a certain quarter within a particular area of the court. In addition, it is possible to select a specific time point of the ball map (e.g. turn over) and it will also pull up the related video footage of the game at that time point. Most other video analysis tools provide only the temporal mapping feature (the actual video footage of the game), making it a little more difficult to quickly identify patterns within the play.

Pattern Plotter images kindly provided by Lyndell Bruce

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Lyndell explained that prior to a game it is necessary to set up the codes (e.g. centre pass, long court) you want to use. During the game live coding occurs where in this case, Lyndell, coded both the Australian team and the opposition that they were playing so that it was possible to see the ball path, turnovers and goal attempts for both teams. By coding both teams it enables the video analyst to provide information to the coach about opportunities that were missed; for example, when the Australian team was not quick enough to react and adjust their play in relation to an opposition strategy.

After the game the video analyst still has some work to do once they are back at the hotel. They break down the footage into common themes (essentially a digital filing cabinet) such as centre passes or long court. The footage can be broken down further depending on specific coaching requests for the game, such as defensive goal circle, attacking turnovers or centre pass. There is also the potential to provide individual player game analysis within the context of the game in the form of statistics about the quantity, time they occurred and location on the court of things such as turnovers, stepping, percentage of passes or shots at goal (successful/unsuccessful), or held ball for that individual.

Breaking down the footage in this manner allows you to select the code word (e.g. turnovers) and that quickly links to both the pattern data and the raw video footage of the game at the specific times that it occurred in the game for either the Australian team or the opposition team.

International teams only come together for short periods of time and have matches more frequently than State teams and therefore are likely to have a slightly different approach to their performance analysis compared with State teams who may have the video analyst put together a highlights package for individual players. Sometimes this is provided online for players to access or provided as a file sent to their mobile device so that they can provide comment, after which coaching staff can go in and look and have either individual or playing group meetings because they are in a daily training environment for an entire season.

Other Game Analysis Software

**Kinovea** is free software that enables you to complete temporal mapping of video footage. **Sports Code, Silicon Coach** and **Dartfish** are all common video analysis software used in elite sport and are user pays.

A nice summary of the types of video analysis software used in elite performance and the platform (mac/PC) it is available for can be found at this [link](#).
As I am sure you will be aware most of the software being used in elite sport has been prohibitive for use in schools due to both the cost and the complexity of the software.

Some software, such as DARTFISH™ and Silicon Coach™, have more recently been developed with education versions, some of which are web-based, to make it more accessible. This has definitely assisted with people being able to access the software however, for some schools it may still be out of reach.

The explosion of 'apps' that can be used on smart phones and tablets such as iPad®s and the small or no cost associated with them has provided an exciting opportunity for teachers to integrate video analysis into their teaching more easily.

These 'apps' allow basic biomechanical analysis to be conducted by students and/or the teacher to break down a skill to refine the motor skill or within a game context to understand the application of that skill. In addition, team analysis within a game setting can be conducted using some of the other 'apps' that have more recently become available.

As would be expected there are other functions that the more advanced and expensive software used in elite performance enable the user to do, that an 'app' does not. However, the trade-off of having to use a few 'apps' to obtain some of the same sort of outcomes is still likely to provide valuable learning opportunities for students.
**Game analysis using 'apps'**

PLATOsport is an interesting new edition to the 'app' market that enables game analysis to be conducted in a not too dissimilar way to that of an elite sporting environment. The name of the 'app' relates to what you can record (Player, Location, Action, Time, Outcome) about the game you are analysing. You can layer your coding options, produce graphs of the results and share both the graphs and the raw data file. It comes with courts or fields for 8 different sports that allows you to tap the screen at the location on the court or field where the event occurs so that you can contextualise the data about the player or event to a specific location. A quick start video is available to show you how it works.

**Easytag DARTFISH** also has a video available. It can be used as a stand alone 'app' or synced with DARTFISH software post game to provide more in-depth analysis. As with PLATOsport you can code two teams. As a stand alone 'app' the data can be reviewed as a summary, by time or by category. However, it is not contextualised within a field or court environment. Data can be shared as an email and a .csv file is provided that means the data can be opened in a spreadsheet.

**Coach Plus ‘apps’**


Provide slow motion, on screen drawing, angles, reference clips that can be used for side-by-side or overlay comparison and a ball speed measure. Email is a feature of some of these.

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Technique Analysis using 'apps' cont.

Coaches Eye
Provides slow motion, on screen drawing and angles, audio notes and frame-by-frame analysis. Email, YouTube™ and text messaging are the export options.

Sports Cam video motion analysis
Provides slow motion, on screen drawing and angles, side-by-side or overlay comparison, text and audio notes. Email, YouTube™ and Facebook™ are the export options.

Vernier Video Physics
On screen drawing, ball path plotting and graphs are possible. Email and Facebook™ are export options.

Video Coach
On screen drawing and text is possible. Export is via wireless file transfer.

Excelade
On screen drawing and angles, side-by-side or overlay comparison, text and audio notes. Can be shared with email, Facebook™ or Twitter™.

Burst Mode
Is not a game analysis or technique analysis tool in the true sense but takes photos continuously in a sequence that you could then look at frame by frame to break down a skill.