Hawk-Eye Technology

New Technology used in sports

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Hawk-Eye is a computer system used in cricket, tennis, snookers and other sports to visually track the path of the ball and display a record of its most statistically likely path as a moving image.

Hawk-Eye as the most innovative technology provider in sports broadcasting and is a development that will reinforce the group's presence and influence.

It is primarily used by the majority of television networks to track the trajectory of balls in flight.
Abilities

- *Hawk-eye* can track any type of bounce, spin, swing and seam movement of the ball.

- Give a prediction as accurate as 99.99 percent.

- Hawk-Eye was used for referring decisions to the third umpire in LBW.
A Hawk-Eye system is based on the principle of "Triangulation".

**Triangulation** is the process of determining the location of a point by measuring *angles* to it from known points at either end of a fixed baseline.
\[ l = \frac{d}{\tan \alpha} + \frac{d}{\tan \beta} \]

\[ d = \frac{l}{\left(\frac{1}{\tan \alpha} + \frac{1}{\tan \beta}\right)} \]
Hawk-Eye takes 2 inputs

1. Video provided by 6 different cameras placed at 6 different places.
2. The speed of the ball.

The system rapidly processes the video feeds by a high speed video processor.
Processor follows 4 steps

(a) Identify each frame from each camera, and groups the corresponding pixels to the image of the ball

(b) Compute for each frame the 3D position of an image thus identified using ball image data from at least two different cameras
(c) Predict a ball flight-path from the said 3D ball position as computed in successive frames.

(d) Map the predicted path on the modeled area so as to identify any interaction with one or more of the said characteristic features.
Applications

Its applications are mainly in sports

- Cricket
- Tennis
- Snookers and
- In some games
Cricket

- Used in the third umpire decision (Referral system)
- At the end of an over, all six deliveries are shown simultaneously to show a bowler's variations such as bounce, speed variations and ball deviation.
- To view the deviation of the ball from actual track.
Tennis

- Hawk-Eye was first used in tennis in the year 2004 (US open tennis).
- In tennis Hawk-Eye generates the impact of the ball whether the ball is “IN” or “OUT”
Snookers

- This technology is useful in cases where the cue ball touches the specified ball first or any other ball.

Games

- Some games such as “Brian Lara Cricket 2005” also support this technology.
FURTHER DEVELOPMENTS

- Hawk-Eye is already working on implementing a system for basketball.
- The Football Association has declared the system as "ready for inspection by FIFA", after tests suggested that the results of a goal-line incident could be relayed to the match referee within half-a-second.
Conclusion

- This technology has met the high reality and accuracy features. We have thus seen that the HAWK EYE is a great innovation, which puts technology to good use in the field of sports.
- Very fast and accurate (99.99%).
- Has a great future.
- This technology helps to have correct decisions in any kind of game.
REFERENCES

2) www.hawkeyeinnovations.co.uk
3) www.therulesofcricket.co.uk
Thank you
Queries...?