



Semi-Automated Offside Technology

Why in News?

[Federation Internationale de Football Association \(FIFA\)](#) is using **Semi-Automated Offside Technology (SAOT)** for offside decisions in the ongoing football world cup.

- The point of the offside rule is to prevent attacking players from perpetually camping in front of the opponent's goal.

What is Semi-Automated Offside Technology?

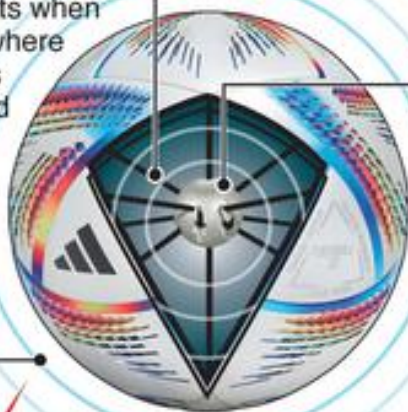
- SAOT is a **support tool for the video match officials and the on-field officials** to help them make faster, more reproducible and more accurate offside decisions.
- There are two parts to the technology — **a sensor inside the match ball** that is held using suspension technology, and existing tracking tools that are part of the Video Assistant Referee (VAR) system.
- **Every time the ball is hit, data is sent in real time** (at a whopping 500 frames per second) to a network of antennae installed around the playing field.
- Additionally, **there are 12 Hawk-Eye cameras set up around the turf that shadow both the ball and the players**, with as many as 29 separate points in the human body tracked.
- The coming together of the ball sensor and the Hawk-Eye cameras is in effect SAOT.
- These **two data sets are run through [artificial intelligence software](#)** which generates automated alerts about offsides to the match officials. This replaces the manual effort taken in poring over replays for minutes on end.

Semi-automated offside technology

A new system to detect the position of the ball and all 22 players should enhance Video Assistant Refereeing at the World Cup

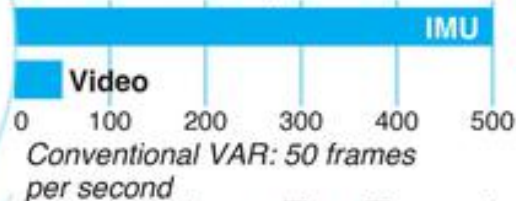
KICK POINT PRECISION

Automatically detects when and where ball is kicked



Connected Ball Technology:
Suspension System holds and stabilises inertial measurement unit (IMU) motion sensor

IMU transmits inertia data of ball – kick-point, location, direction – at 500Hz, 500 times per second



PLAYER POSITIONS

Artificial Intelligence

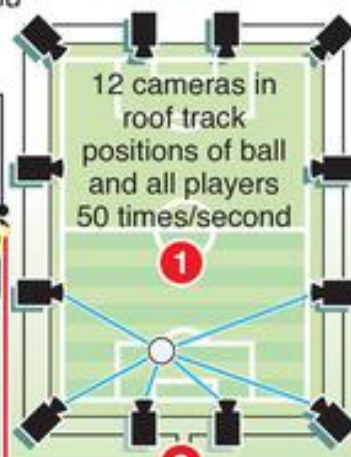
Assigns and tracks up to 29 data points for each player

Defender

Furthest data point defines offside line

Logged Extremities relevant to offside calls

System tracks when ball is received by player in offside position when ball was kicked



OFFSIDE

Alert triggered and validated in Video Operation Room

OFFSIDE LINE

Data point projects beyond offside line

Decision communicated to referee



Source: TH