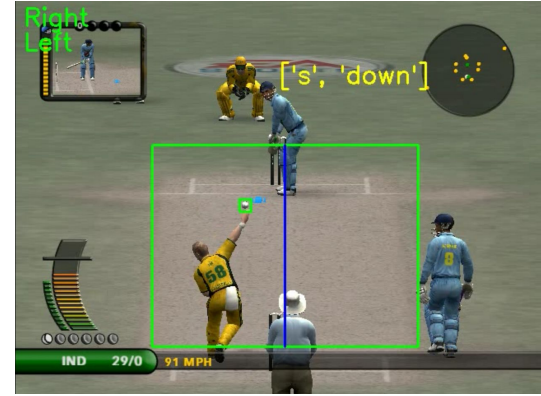




+ Computer Vision **=**



EA Sports Cricket 07: Transforming Gameplay Through Vision Automation

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AIM: Automate the batting and win a game

Challenges Involved:

- Track the ball
- Timing the shot
- Decide the kind of shot
 - This depends on various factors
 - Handedness of the batsman
 - Where the ball is in the space
 - And other factors which we are not focusing on like speed, spin, swing etc.

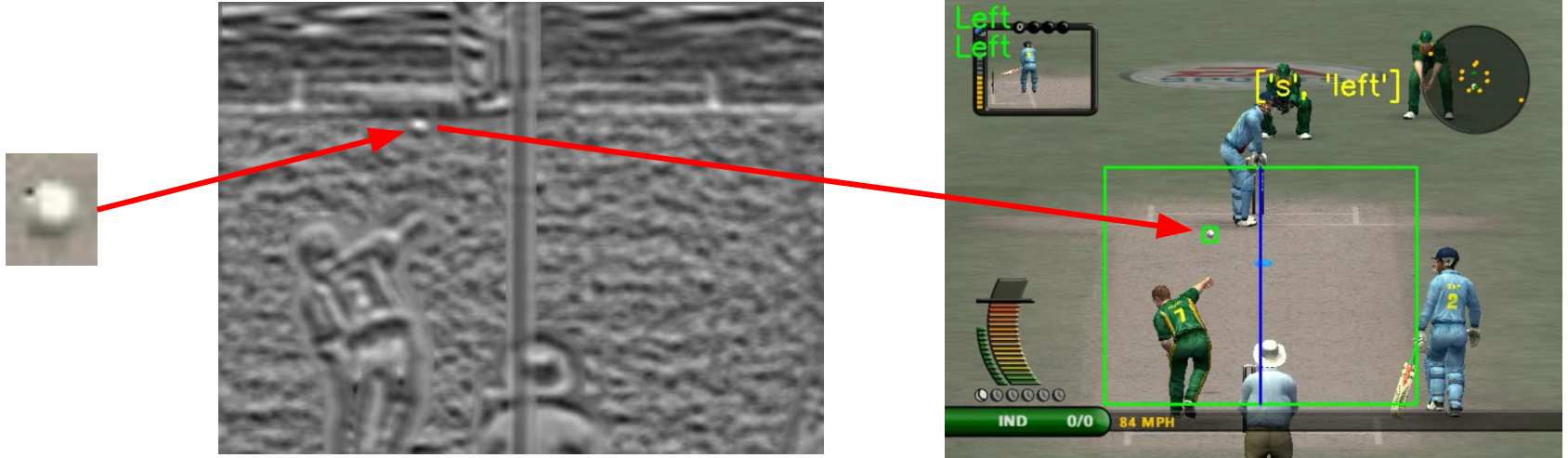
AIM: Automate the batting and win a game

Gameplay



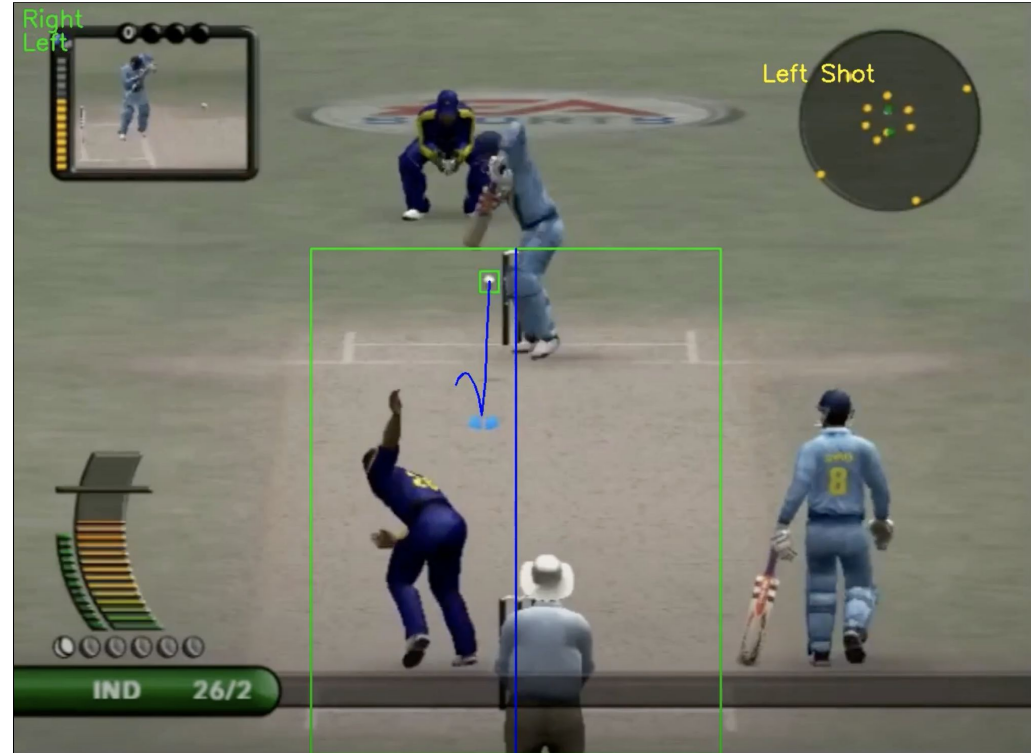
Challenge 1 - Track the ball

Template Matching in the AOI/ROI



Challenge 2 - Timing the shot

Execute the shot when the ball is on the top 40% of the AOI



Challenge 3 - Decide the type of shot

1. Handedness of the batsman

- Can not be done with template matching as the batsman keeps moving and can be in different postures.

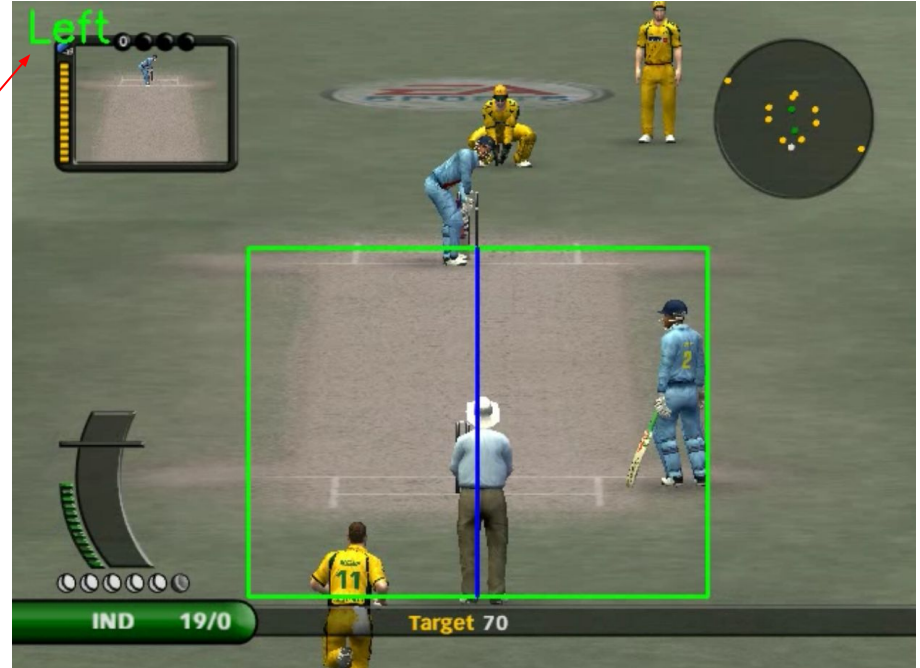
NeuralNet Architecture:

```
model = Sequential()  
model.add(Conv2D(32, (3, 3), input_shape=(IMAGE_WIDTH, IMAGE_HEIGHT, 3), activation='relu'))  
model.add(MaxPooling2D(pool_size=(2, 2)))  
model.add(Conv2D(64, (3, 3), activation='relu'))  
model.add(MaxPooling2D(pool_size=(2, 2)))  
model.add(Flatten())  
model.add(Dense(64, activation='relu'))  
model.add(Dense(3, activation='softmax'))  
model.compile(optimizer='adam', loss='categorical_crossentropy', metrics=['accuracy'])
```

Challenge 3 - Decide the type of shot

1. Handedness of the batsman

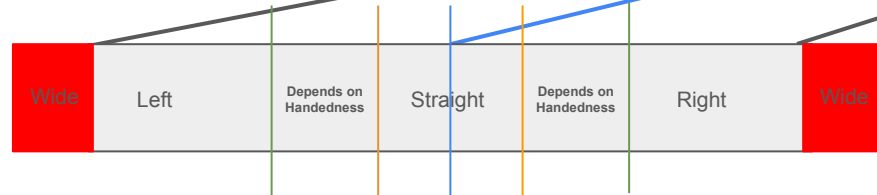
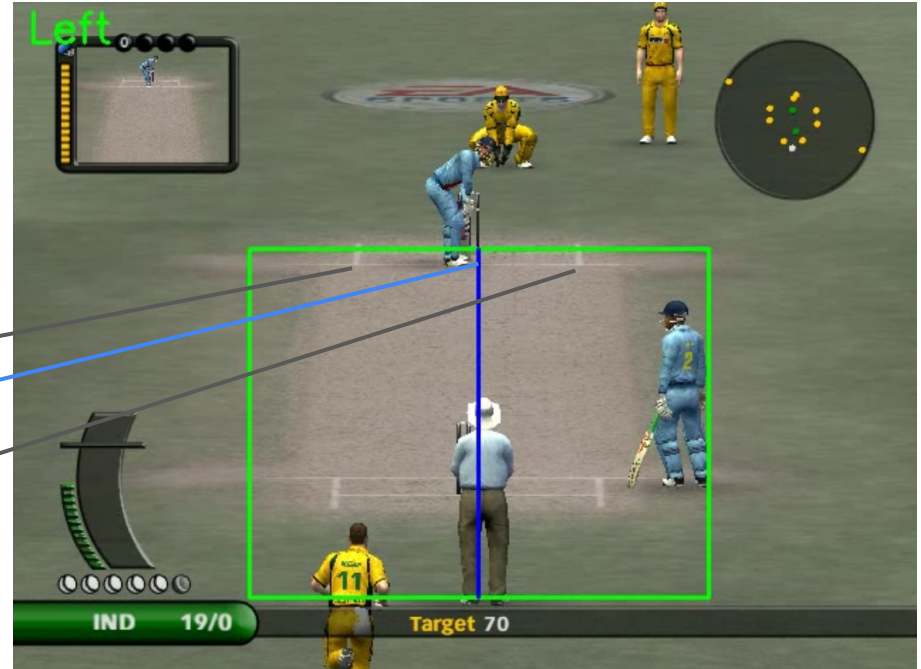
The predicted result will be written on the top left corner of the frames



Challenge 3 - Decide the type of shot

2. Where the ball is in the space

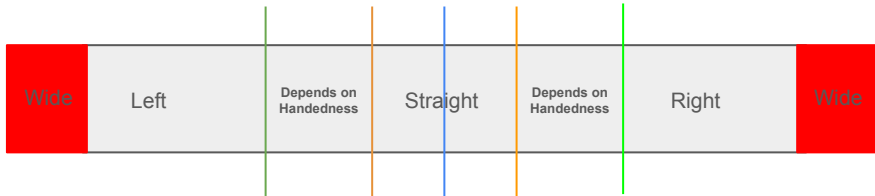
We are using a heuristic approach to decide which side to play the shot based on the x-coordinate of ball's midpoint



Challenge 3 - Decide the type of shot

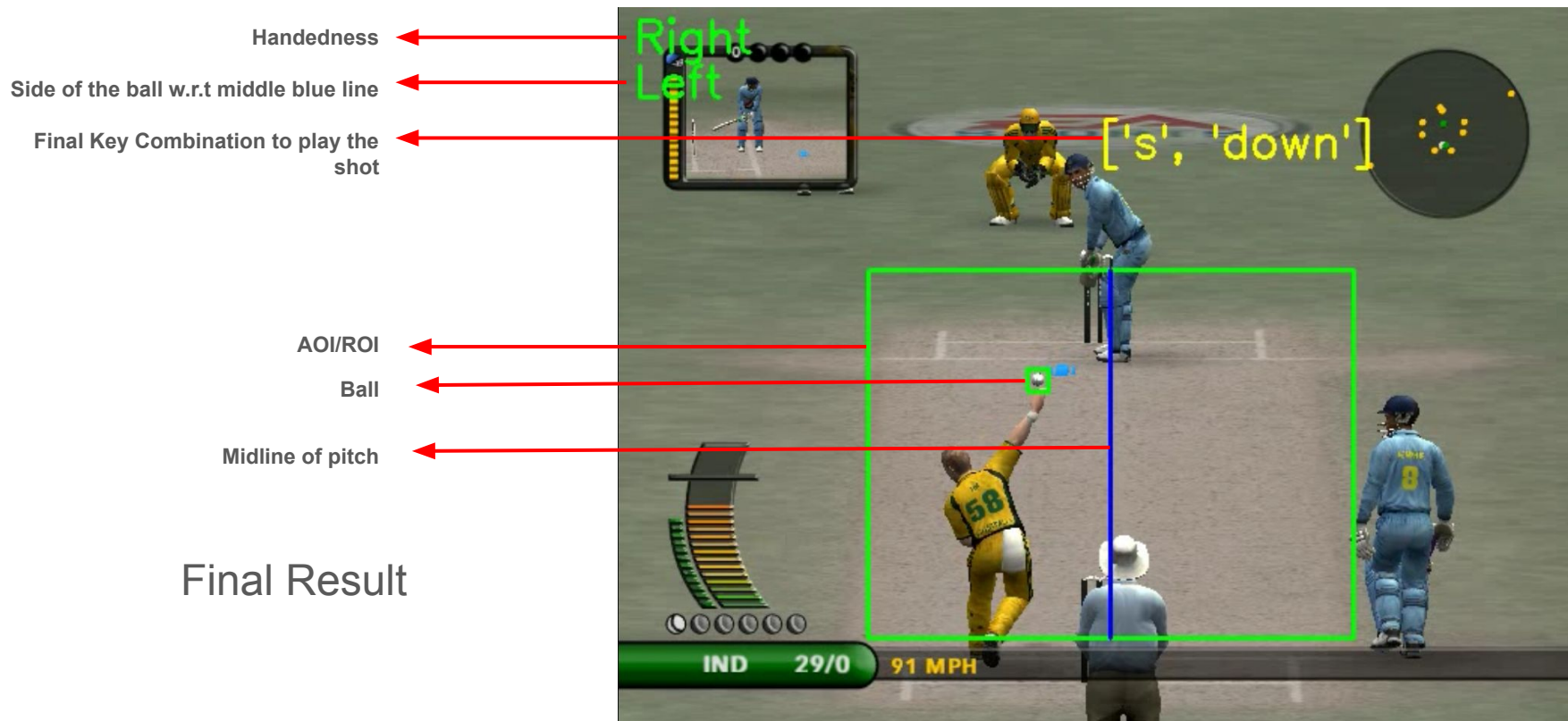
2. Where the ball is in the space

We are using a heuristic approach to decide which side to play the shot based on the x-coordinate of ball's midpoint



```
def determine_shot(ball_x_center, middle_x, x1, x2, count, handedness):  
    if ball_x_center < middle_x and ball_x_center > x1 + (middle_x - x1) *  
0.70:  
        return ["s", "down"]  
    if ball_x_center < middle_x and ball_x_center > x1 + (middle_x - x1) *  
0.50:  
        if handedness == "Left":  
            return ["s", "down", "left"]  
        else:  
            return ["s", "down"]  
    if ball_x_center < middle_x:  
        return ["s", "right"]  
  
    elif ball_x_center > middle_x and ball_x_center < middle_x + (x2 -  
middle_x) * 0.70:  
        return ["s", "down"]  
    elif ball_x_center > middle_x and ball_x_center < middle_x + (x2 -  
middle_x) * 0.50:  
        if handedness == "Right":  
            return ["s", "down", "right"]  
        else:  
            return ["s", "down"]  
    elif ball_x_center > middle_x:  
        return ["s", "left"]
```

Challenge 3 - Decide the type of shot

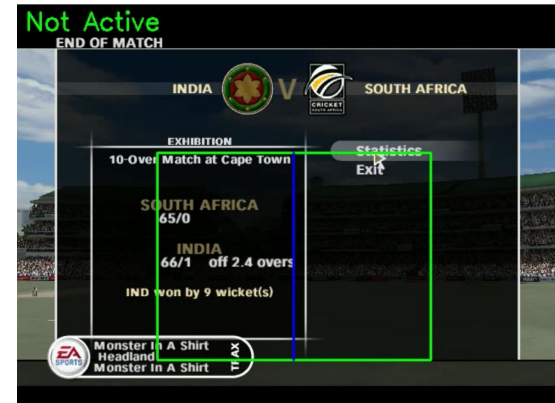


AIM Achieved!

These screenshots showcase our automation's most remarkable victories.

1. IND vs AUS: IND won by 10 wickets in 2.5 overs (i.e 17 balls). Score: 73
2. IND vs SA: IND won by 9 wickets in 2.4 overs (i.e 16 balls). Score: 66

The full video recordings of both matches are included in the report.



Thank you!