



# **SoCal FC**

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A background image of a FIFA football game. It shows a wide-angle view of a green pitch with players in red and white kits. In the top center, a scoreboard reads 'AMISTOSO INTERNACIONAL CAN 0-0 EUA'. Below the pitch, there are photographers and a tactical board showing player positions. The stadium is filled with spectators.

# FIFA

- Football Simulation Video Games
- Developed by Electronic Arts
- Release new version of the game annually
- Over of 25 years of Video Game Production



# PIPELINE

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- Motivation
- Object Detection
- Learn how to Play
- Future Scope and Problems





# MOTIVATION

- Over 45 million people play FIFA 18
- Trendy and Complex Game
- Real Time Artificial Intelligence
- Deal with time series data



# OBJECT DETECTION

- Data Collection & Labelling
- Preprocessing
- Model
- Output



The background is a screenshot from a FIFA video game. It shows a soccer match between Canada (CAN) and the United States (EUA) during an 'AMISTOSO INTERNACIONAL' (friendly international) match. The score is 0-0 at the 22:01 mark. The stadium is filled with spectators, and various banners for 'EASPORTS.COM/FIFA' and 'VISIT US AT' are visible. At the bottom, there is a tactical diagram of the field with player positions marked by colored dots. Player names 'R. WILKINSON 7' and '22 M. KLINGENBERG' are displayed on the bottom left and right respectively, along with their respective national team crests.

# Data Collection & Labelling

- Screenshots of Game Video
- Bounding Boxes

The background of the slide is a screenshot from the video game FIFA 11. It shows a soccer match in progress on a green field. In the top left corner, a scoreboard displays '22:01' next to an orange bar, followed by 'CAN 0-0 EUA' with the respective national team crests. Above the scoreboard, the text 'AMISTOSO INTERNACIONAL' is visible. The stadium is filled with spectators. Advertisements for 'EASPORTS.COM/FIFA' and 'VISIT US AT' are visible on the perimeter of the field. At the bottom of the screen, there is a tactical diagram showing player positions with red and white dots. On the bottom left, a player name 'R. WILKINSON 7' is shown next to a Canadian flag icon. On the bottom right, a player name '22 M. KLINGENBERG' is shown next to a USA flag icon.

# Preprocessing

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- Reduce image resolution
- Dropped resolution to 900x400
- PCA Compression



A screenshot from the video game FIFA 14 showing a soccer match between Canada (CAN) and the United States (EUA) during an "AMISTOSO INTERNACIONAL" (friendly match). The score is 0-0 at the 22:01 mark. The background is a virtual stadium filled with spectators. In the foreground, a large white title "Model & Training" is overlaid on the left side of the screen, with a horizontal white line extending from its right edge across the middle of the image. Below the title, a bulleted list contains three items: "Convolutional Neural Networks", "Single Shot Detection", and "MobileNet". At the bottom of the screen, there is a tactical diagram showing player positions on the field, with names "R. WILKINSON 7" and "22 M. KLINGENBERG" displayed on either side. The EA Sports logo and website URL "EASPORTS.COM/FIFA" are visible on the stadium's advertising boards.

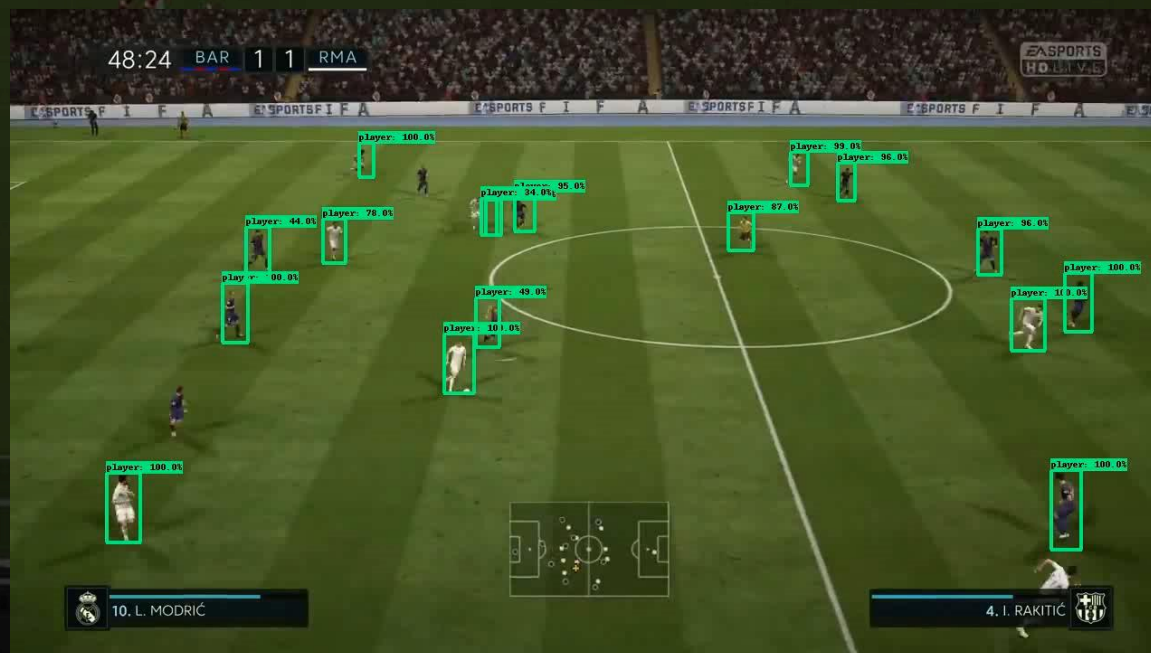
# Model & Training

- Convolutional Neural Networks
- Single Shot Detection
- MobileNet



# Output

- 128-bit feature vector
- Bounding boxes on objects like players, goal



# LEARNING TO PLAY

- Data Collection & Labelling
- Model & Training
- Results
- Oversampling Techniques
- Updated Results





The background is a screenshot from a FIFA video game. It shows a soccer match in progress on a green field. In the top left, a scoreboard displays '22:01' and 'CAN 0-0 EUA'. The stadium is filled with spectators. At the bottom, there are player names 'R. WILKINSON 7' and '22 M. KLINGENBERG' next to their respective team logos (Canada and USA). A tactical diagram of the soccer field is visible at the bottom center, showing player positions with colored dots.

# Data Collection & Labelling

- Made batches of size 10 of the 128 – bit feature vectors
- Used this as input for our model to learn how to play

The background of the slide is a screenshot from the video game FIFA 11. It shows a soccer match in progress on a green field with white markings. In the top left corner, a scoreboard displays '22:01' next to an orange bar, followed by 'CAN 0-0 EUA' with the respective national team crests. Above the score, the text 'AMISTOSO INTERNACIONAL' is visible. The stadium is filled with a large crowd of spectators. Various banners are visible around the pitch, including 'EASPORTS.COM/FIFA' and 'VISIT US AT'. At the bottom of the screen, there is a tactical diagram showing player positions with colored dots. On the bottom left, a player name 'R. WILKINSON 7' is shown next to a Canadian flag icon. On the bottom right, '22 M. KLINGENBERG' is shown next to a USA flag icon.

# Model & Training

- 2 LSTMs in Parallel
- One for direction of player, one for action performed by player
- Training Data: 50 MB of 128-bit vectors





# Preliminary Results

- Frequency of passing and shooting was lower than required
- Minority actions not properly learnt by model



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# Oversampling

- Copied the minority class instances multiple times to increase the number of samples.
- Additional training data added



22:01 AMISTOSO INTERNACIONAL  
CAN 0 - 0 EUA

# Updated Results



The background is a screenshot from the video game FIFA 11. It shows a soccer match in progress on a green field. The stadium is filled with spectators. At the top, a scoreboard displays '22:01' and 'CAN 0-0 EUA'. A large white title 'Future Scope & Problems' is overlaid on the center of the image. Below the title, there are two bullet points. At the bottom, there are player names 'R. WILKINSON 7' and '22 M. KLINGENBERG' with their respective team logos (Canada and USA).

# Future Scope & Problems

- AI bot only plays from the left side of the field and shoots right
- Need better players for bot to learn football tactics