# AI ENGINEER SKILL TEST

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# 1 Exercise 1

**Solution:**

1. Training dataset: To obtain the face-cropped images of champions for training the model, I downloaded all the available images from ChampsDB since the source Wild Rift does not provide such images. However, some champion names were misspelled, which required manual correction to enable successful downloading. The number of images was limited to one for each champion. This process was carried out using the notebook **crawl_train_dataset.ipynb**, which created a folder named **train_dataset**.

2. Building the training pipeline: I first loaded and resized the training images to (75,75) to match the resolution of the test set. Then, I employed a pre-trained Keras model for transfer learning, given the limited training data. Finally, I trained the model and saved it.

3. Testing: I loaded the test set and resized the images to (75,75). The images were also cropped to the left-half, and face detection was used to extract the face of the left champion. If the face detection algorithm returned None, I cut the original image into one-fourth to the left for prediction.

   **Evaluation:** As a third-year student who is still in the early stages of learning in this field, I was able to successfully complete some basic tasks, such as data crawling, selecting appropriate approaches based on hypotheses, and performing training and testing. However, I faced some challenges, such as advanced data preparation (e.g., finding additional data sources) and identifying more professional approaches for this problem. As a result, my testing results were not satisfactory.

## 2 Exercise 2

The aim of this project is to create an automated highlight moment identification system for FIFA 23. The system should be able to evaluate live streams or recorded films of FIFA 23 matches to identify the most exciting parts of the game, such as goals, key saves, and other events that spectators are likely to be interested in. The algorithm will then generate short video clips of these highlights and distribute them over social media sites.

Pipeline:

1. Video analysis: The first step is to analyze the video stream or recorded video of the match. This can be done using computer vision techniques such as object detection and tracking. The system should be able to identify the players, the ball, and the goals in the video stream.

2. Event detection: Once the video has been analyzed, the system should be able to detect important events in the match, such as goals, saves, and other exciting moments. This can be done using machine learning algorithms that are trained to recognize patterns in the video stream associated with these events.

3. Video clipping: After the events have been detected, the system should create short video clips of each highlight moment. The clips should be long enough to give viewers a sense of the excitement of the moment but not so long that they lose interest.

4. Sharing on social media: The final step is to share the video clips on social media platforms such as Twitter, Facebook, and Instagram. The system should be able to automatically post the clips with appropriate hashtags and descriptions to maximize their visibility.

Challenges:

1. Variability in camera angles: Different camera angles can make it challenging to detect events in the video stream. The system should be able to handle different camera angles and adjust its algorithms accordingly.

2. Noise in the video stream: Noise in the video stream can make it challenging to identify important events. The system should be able to filter out noise and focus on the most relevant parts of the video stream.

3. False positives: The system may detect events that are not actually highlights, such as a player kicking the ball out of bounds. The system should be able to distinguish between true highlights and false positives.

Solutions:

1. Multiple camera angles: The system should be trained on data from multiple camera angles to ensure that it can handle different perspectives.

2. Noise reduction: The system should use filters to reduce noise in the video stream, such as median filters or Gaussian filters.

3. Thresholding: The system should use thresholding techniques to distinguish between true highlights and false positives. For example, the system could require that a goal be scored within a certain distance of the goalpost to be considered a highlight moment.