

A close-up photograph of a bright yellow-green tennis ball resting on the strings of a dark blue tennis racket. The background is a soft, out-of-focus bokeh of warm yellow and blue light, suggesting an outdoor setting. A white curved line separates the image from the text on the right.

# Sport Analytics: Tennis

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**Date:**

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# **Motivation:**

Improve Performance with Data

# **Problem:**

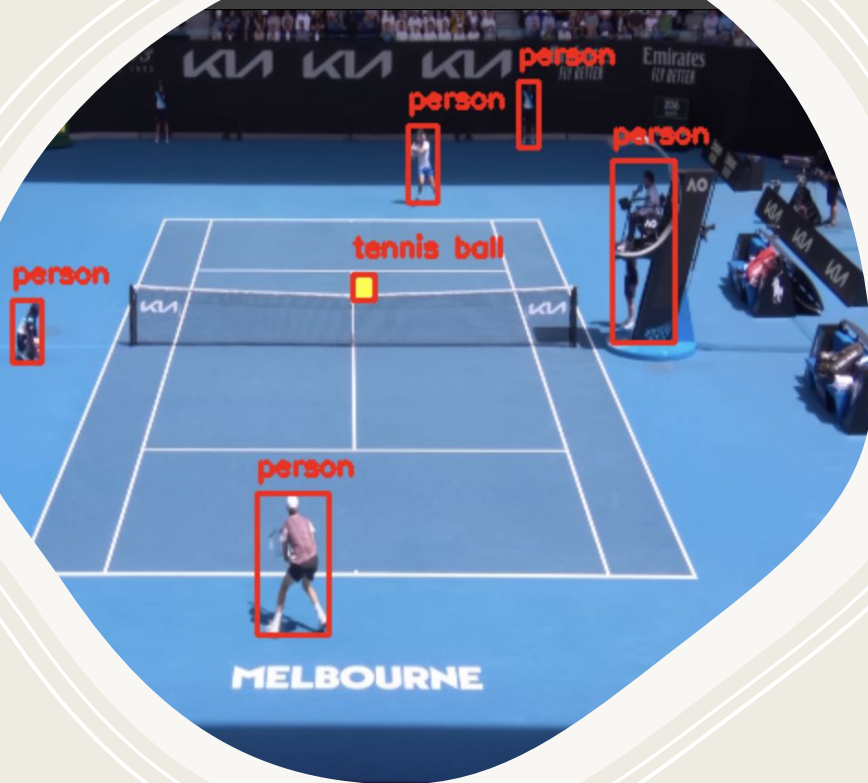
Scalability and Precision

# **Solution:**

Computer Vision approaches

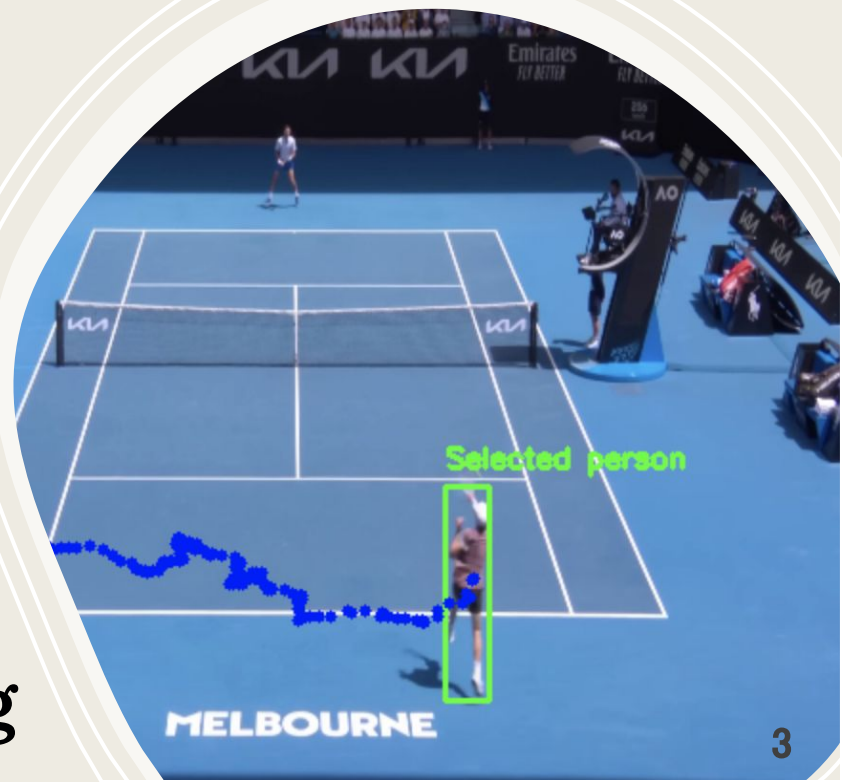
# Algorithm: YOLO Nano 8

Frame



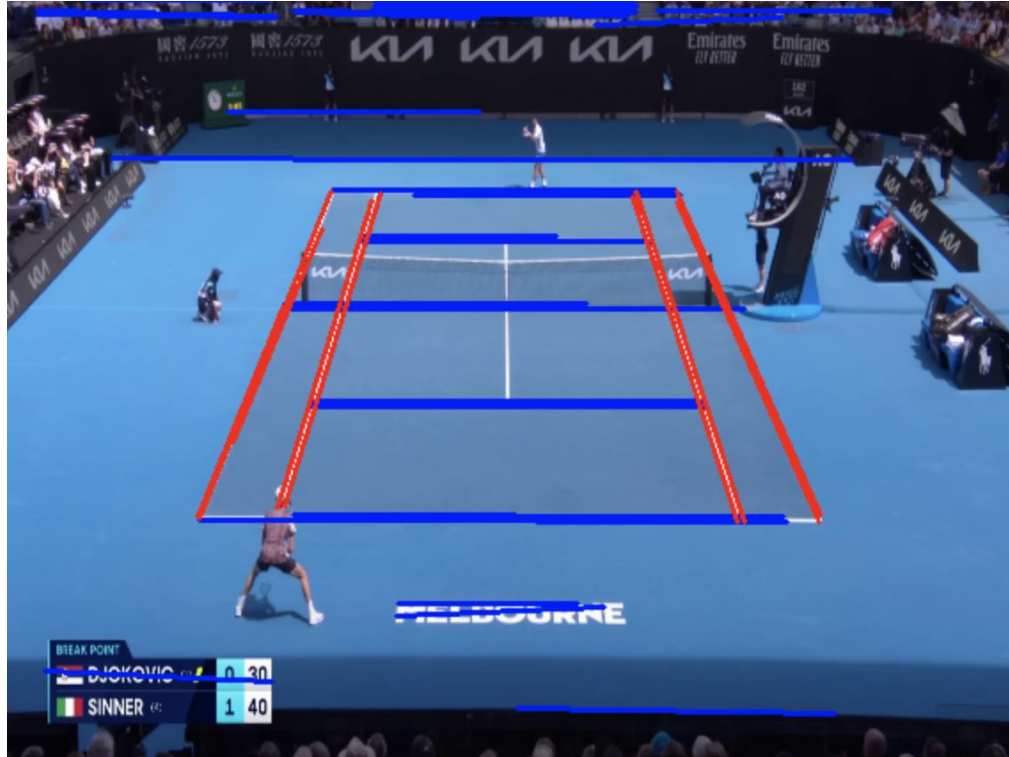
Object  
Detection

Object  
Tracking

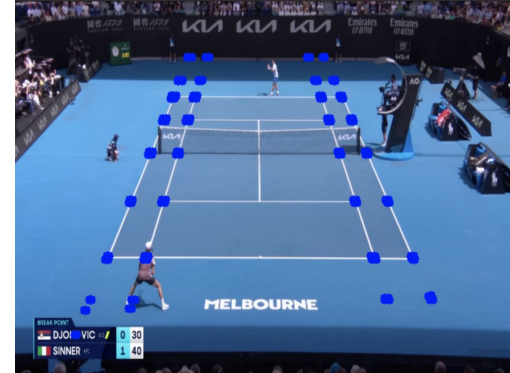


# Feature detection

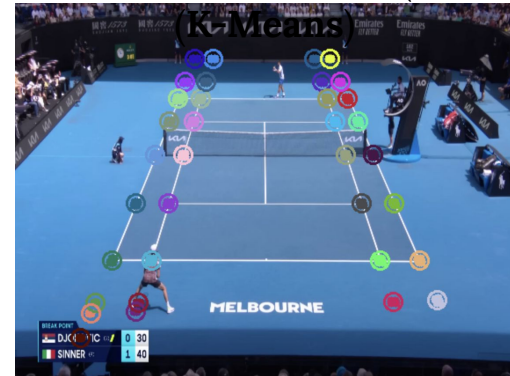
Find **Horizontal** and **Vertical** Lines with **Canny Detector** and **Hough Transform**



Compute the **Intersections**

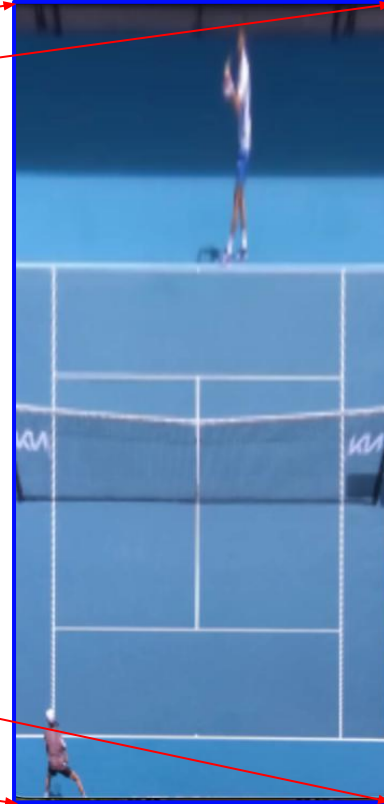
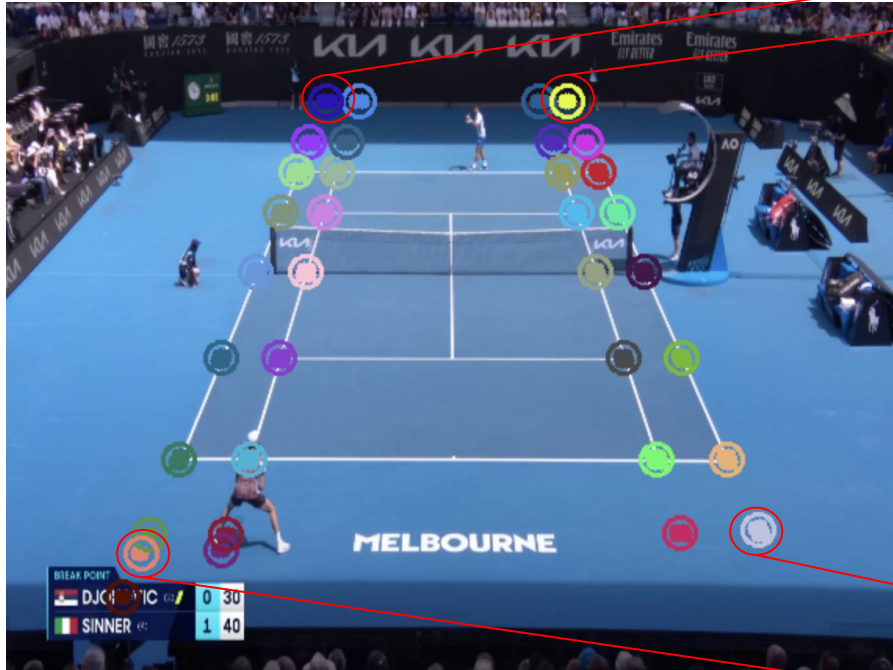


**Cluster** the Intersections (**K Means**)

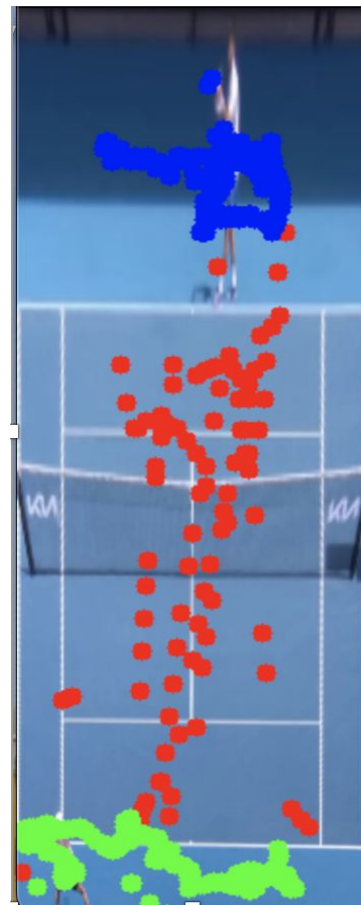
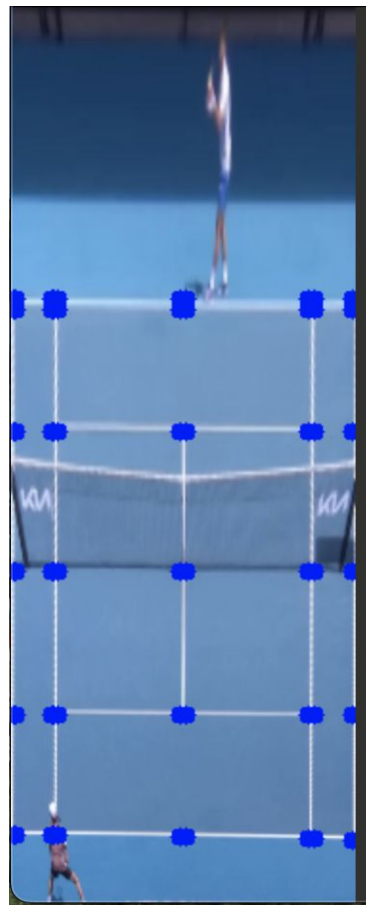
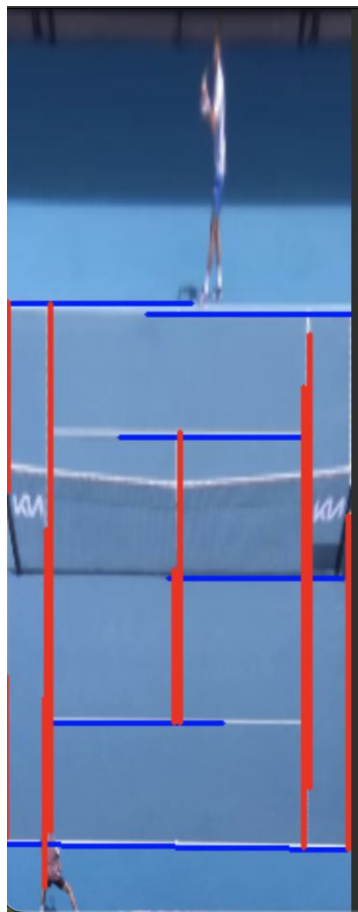




# Image rectification



Apply the **Detection** and **Tracking** Algorithms also on the **Rectified Court** (View from Above)

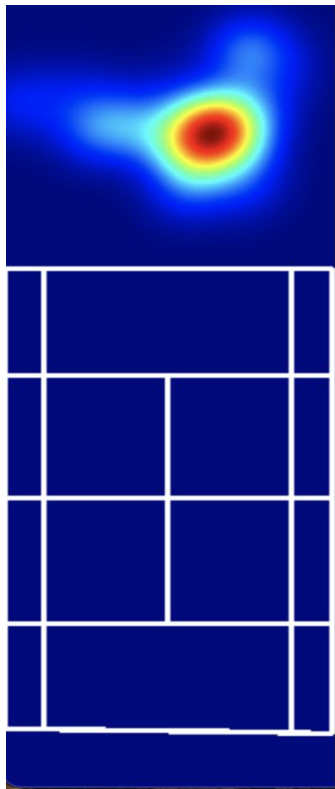


Detection

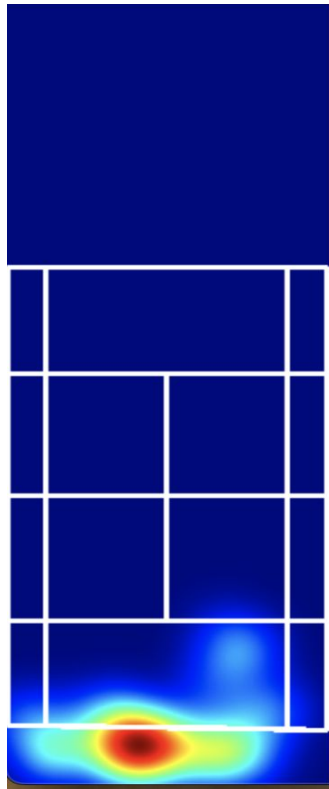
Tracking

# Heatmaps to Analyze the **Position** of the **Players** and **Ball** through the Game

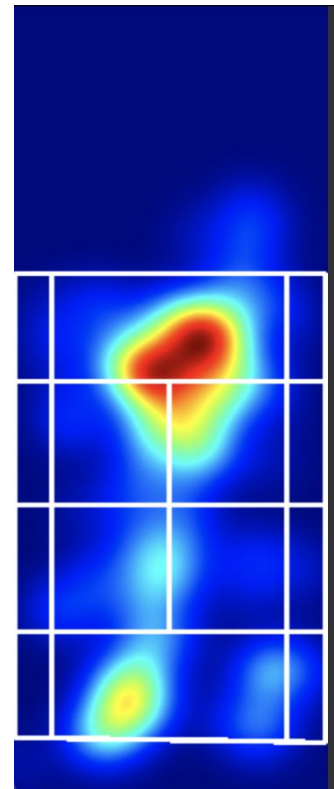
Djokovic



Sinner



Ball





# Future Work

- Run the model on **GPU**
- Analyze a **full** tennis **game**
- Enhance **ball tracking**  
(Bounces, Spin)