

Sports Initiative 20221215

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Initiative: Innovation in Sports

Epic: Data Conceptualization of Game

Epic: Replace Physical Structure with Intelligence

Epic: Replace Referee with Robots



User Stories:

- observe actions in a game
- capture the actors, locations, constraints, segments and all micro actions
- build a software model
- train a machine learning module to capture all details and persist as a series of immutable game actions in blockchain
- Identify physical structures like, goal posts, nets and replace them with intelligence
- no need to reinvent the wheel; procure Tesla Robot; train it for movements on the ground
- with Volumetric Occupancy; train it with games rules; train it to identify fouls, yellow and red cards



Application: the model would be used to train persons, to excel in their sports activities. Video Games could be built based on real-life sports events such as, World Cup Football. No more injury with physical structure in any sports. Train Tesla Robots and replace referee for 2026 World Cup

This document is a collective effort of 31st batch students of Madras Institute of Technology, Chromepet, Anna University, Chennai, Tamil Nadu, India.

Mission: develop innovation and entrepreneurship in student community

Innovation: Needs have always been there; most of the needs are satisfied; some of the needs are not satisfied yet. Unsatisfied needs are the seeds for innovation; Intelligence, Data Collection and Analytics are unsatisfied needs in the sports industry. Training a Referee is possible only with Tesla Robots.

Entrepreneurship: Innovators create wealth; two Phd students developed Google Search Engine at Stanford; Google still shares revenue with Stanford; We could develop both innovation and entrepreneurship at the university. Students working on an epic could go out and start an industry.

Exploration is **the act of searching an unfamiliar area in order to learn about it**. It involves the discovery of new information; students and gurus gather to explore the sports initiative; both hardcore technical students as well as entrepreneur students participate in the exploration.



"Levi Stadium"

"Is it the Jeans pant Levi?"

"Yes."

"Where is it?"

"It is in the Silicon Valley."

“Then it must be technologically sophisticated stadium”

“How is it relevant to our discussion?”

“You are going to build a robot referee for the World Cup 2026.”

“And that robot would perform in the Levi Stadium!”

“Yes.”

“Why don’t they build it?”

“They have all the technology and skill sets.”

“They could. But they have not realized the need for a robot referee.”

“We don’t have the technology. But we had realized the need for a referee.”

“Kennedy wanted to go to the moon; they didn’t have the technology; they developed and landed on the moon.”

“Sure. Let us give it a try.”

“In this sports initiative, we have three epic.”

“Only three, or will it grow?”

“As we start our journey, we may come across new opportunities.”

“Data Conceptualization of a game.”

“This is doable; we don’t need any special hardware or software.”

“How do you do it?”

“Let us take a popular and familiar game; cricket.”

“Okay.”

“Let us take the full game video file and divide it into a set of small files.”

“10 MB video file, divided into ten 1MB files?”

“No. That’s just a physical division; we need to divide logically.”

“Logically how?”

“The cricket game is a 40 overs game.”

“That’s right; each team played twenty overs.”

“We could divide the master video file into 40 small files.”

“How are we going to do it?”

“Do we need to open the file in the video player and like film editing, do we need to stop and save the one-over play?”

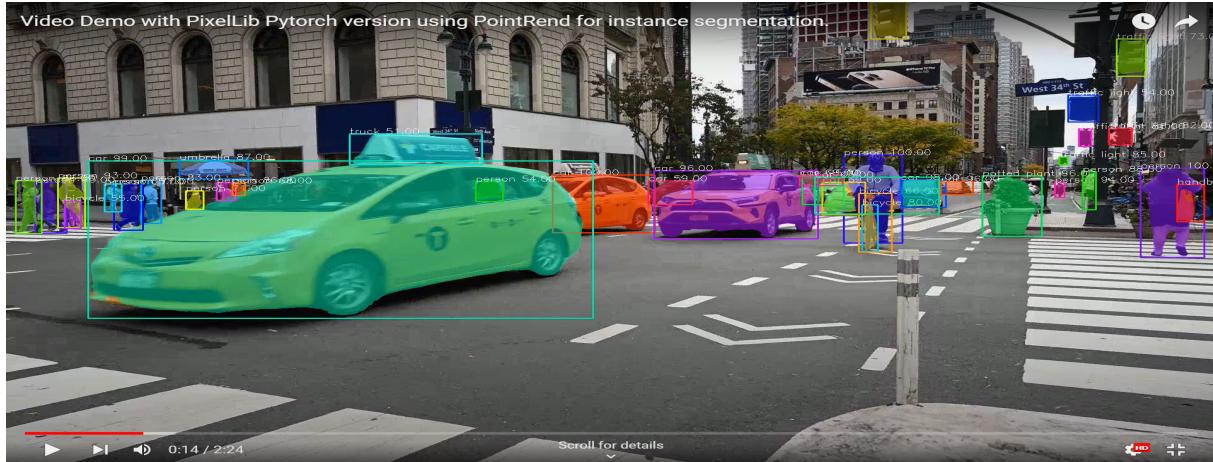
“Could we use AI, python library or Pytorch?”

—
PixelLib makes it possible to perform real time object segmentation in live camera feeds and video files.

Code for Video Segmentation

```
import pixellib
from pixellib.torchbackend.instance import instanceSegmentation

ins = instanceSegmentation()
ins.load_model("pointrend_resnet50.pkl")
ins.process_video("sample_video.mp4", show_bboxes=True, frames_per_second=3,
output_video_name="output_video.mp4")
```



“Once we create 40 video files, then what do we need to do?”

“One video file would have the play of one over; that’s six balls.”

“Do we need to create six sets of data from that one-over video file?”

“Cricket pitch is straight line.”

“But the ball could go in all 360 degrees.”

“We need to capture the angle, velocity.”

“Height!”

“Then we need to build a 3 dimensional volume movement of the ball.”

“How do we partition a football game?”

“There is no fixed 40 overs kind of time limit.”

“High level partition - half time, extra time, penalty kick.”

“Football game starts with the ball, from the middle and gets passed from one player to another.”

“Goal, outside throw, corner kick, foul, penalty shot, red yellow cards.”

“When the ball stops, let us cut the video at that point.”

“In this case, the set of videos may not be of equal size.”

“In football, let us use the chessboard coordinates.”

“Data Conceptualization is doable with artificial intelligence.”

“This robot referee for football is the most challenging one.”

“What are the challenges?”

“The referee keeps moving on the ground.”

“Cricket umpire is simple; just stands at one location.”

“Shall we start with the cricket umpire?”

“Okay.”

“He has a toy that keeps moving around in the hostel wing.”

“What toy?”

“That’s a remote car.”

“Do you use the remote to move around the car?”

“I used to do it when I was in high school.”

“Now, you don’t use the remote.”

“I changed the remote to on-off the car; in case it is about to fall, I turn it off with the remote.”

“Then how does it move around?”

“I fixed a raspberry pi and a camera; with OpenCV, it keeps moving.”

“He puts a carrot.”



“On seeing the carrot, the AI keeps the motor running.”

“Does it go in a straight line?”

“Yes.”

“Could you make it to go on the football field?”

“This toy runs only on smooth surfaces.”

“Get some help from the Auto faculty; make a four wheel moving vehicle; add your raspberry pi on it. Instead of a carrot, make it follow football.”

“Okay. That’s it for now on technical things; you guys can leave the room.”

“By doing these things, do we get a job?”

“Don’t worry my friend; I will start a company and hire you.”

“You cannot pay my salary.”

“You say a number; I will double it.”

“Let us talk about it at the hostel.”

“நீ எல்லாம் தொழில் தொடங்கி, உருப்பிட்டாப்பிலே தான்”

“He deserves it, Madam; he doesn't know his value; we need such a new talent for a project like this.”

“சட்டியிலே ஒன்றும் இல்லை; பிறகு, அகப்பையில் என்ன வரும்”

“I don't want to miss his skill sets.”

“You shall agree to pay the market salary; then bonus; stock options; profit sharing.”

“Sounds Good.”

“Who are all involved in this work?”

“Gurus and Students; then Panorama; then 31st batch.”

“31st batch proposes the initiative; we will take help from experts in Panorama.”

“Seed Capital, Finance, Marketing, Government Relationship, Industry Relationship - experts in Panorama could take care of them. Students and Gurus could stay focused on academics and building the prototype.”