Lightning Talk #7

Slowpitch Softball Detector

sdmay25-11

Project Overview

Slow-pitch softball has specific specifications for a legal pitch with maximum and minimum height requirements.

Our deliverable for this project is a portable and user interactive application to call illegal pitches with three main requirements:

- Accurately detect a softball's maximum height on a pitch
- Trigger an audible "Illegal" if the pitch is outside of the max/min range
- Acts as a faster and more accurate height officiary than umpires

Detection And Tracking Prototype

To begin prototyping different methods to find the height of the softball we first need to be able to find the ball in frame we want to measure.

To accomplish the task of finding the ball and tracking it we developed a prototype that would do two thing:

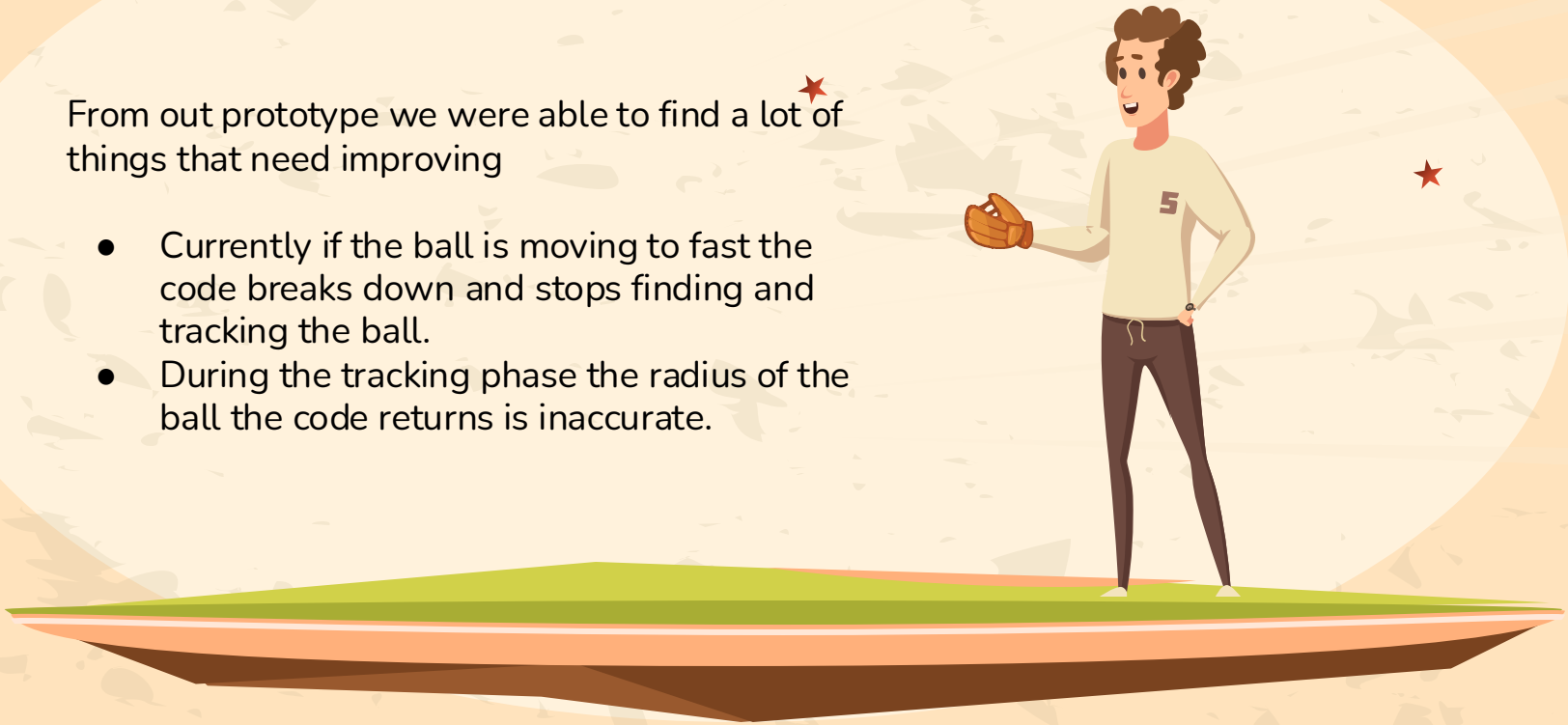
- Find the ball using the object detection model YOLOv5
- Track the detected ball using the CRST algorithm provided with OpenCV

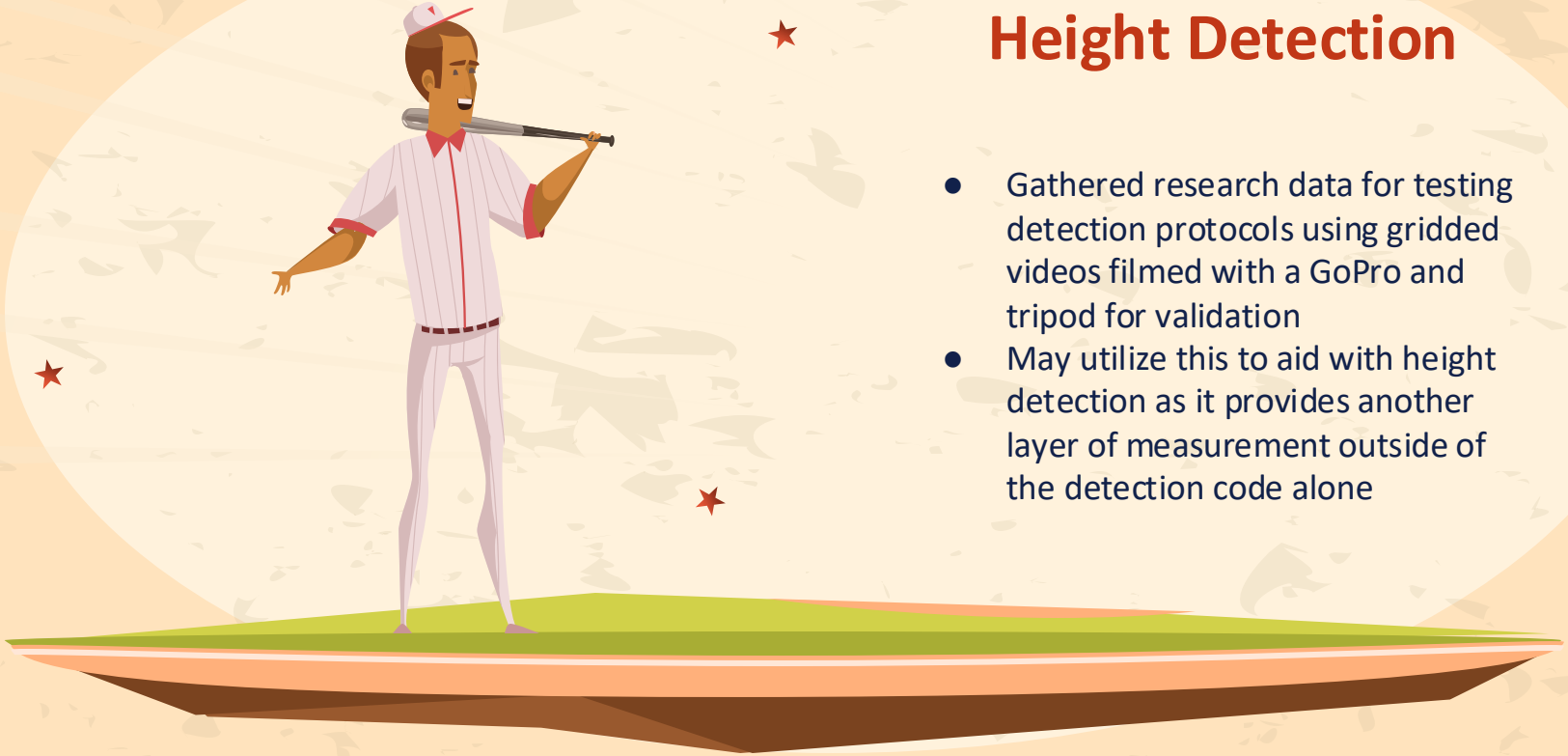
Detection and Tracking in Action

What Needs Improvement

From out prototype we were able to find a lot of things that need improving

- Currently if the ball is moving to fast the code breaks down and stops finding and tracking the ball.
- During the tracking phase the radius of the ball the code returns is inaccurate.





Height Detection

- Gathered research data for testing detection protocols using gridded videos filmed with a GoPro and tripod for validation
- May utilize this to aid with height detection as it provides another layer of measurement outside of the detection code alone

Gridlines on Frame in Action

What Needs Improvement

While we’re happy with the way the lines look, there are some things we are looking to add to improve on the gridlines:

- We want develop an efficient setup of the lines so we do not require more from the umpire than is needed
- Develop ways to integrate the lines into our current detection model

Implications and Next Steps

- We will continue improving on all of our current object detection and height detection models
- We will try to incorporate both our current object detection and height detection into one design
- We will continue adding new functionality and screens within our app design.
- We will make the app available for both IOS and Android.