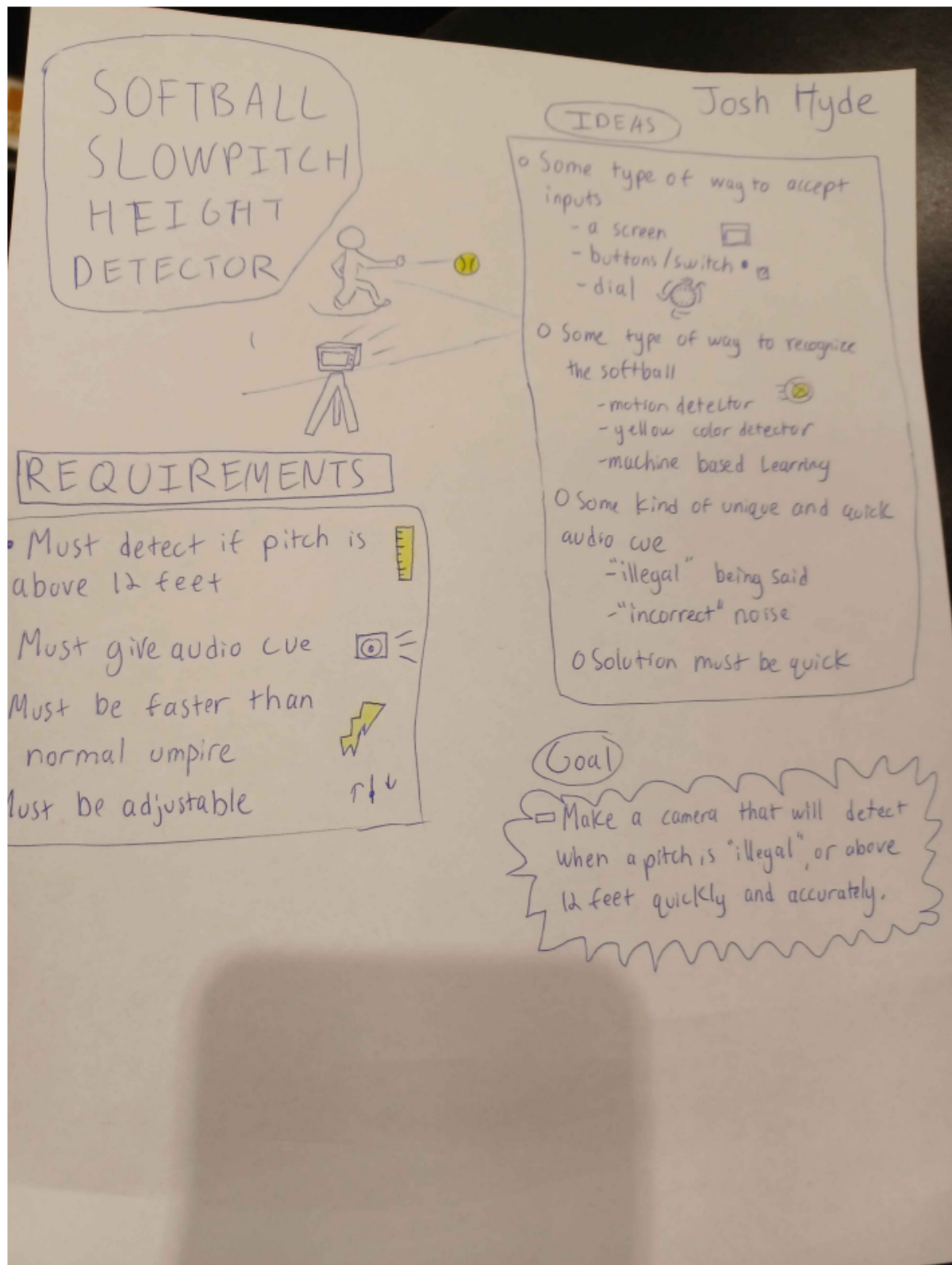


Josh Hyde's sketchnote

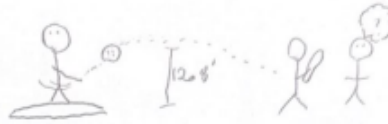


Andrew's Sketchnote

Slow Pitch Softball pitch detector

Problem:

- Umpires have a difficult time determining if a Softball pitch is under the maximum arc angle allowed/ height of ball never exceeds 12 ~~feet~~ feet.



Technical problems:

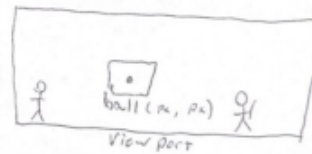
- Reference points:
 - * Camera needs to know where it is in relation to the mound.
- Have only image data to use.

- How to detect ball

Note: Can't we try to find height of ball if camera doesn't know where it is at?

Solution:

- Use an Object detection model to determine where in the frame the ball is at.
- Measure the amount of pixels the ball takes up. Divide that by the number of pixels the gap between pitcher and hitter. Divide the



pixels under ball

Height of ball = $\frac{\text{\# pixels under ball}}{\text{\# pixels between players (known dist)}}$



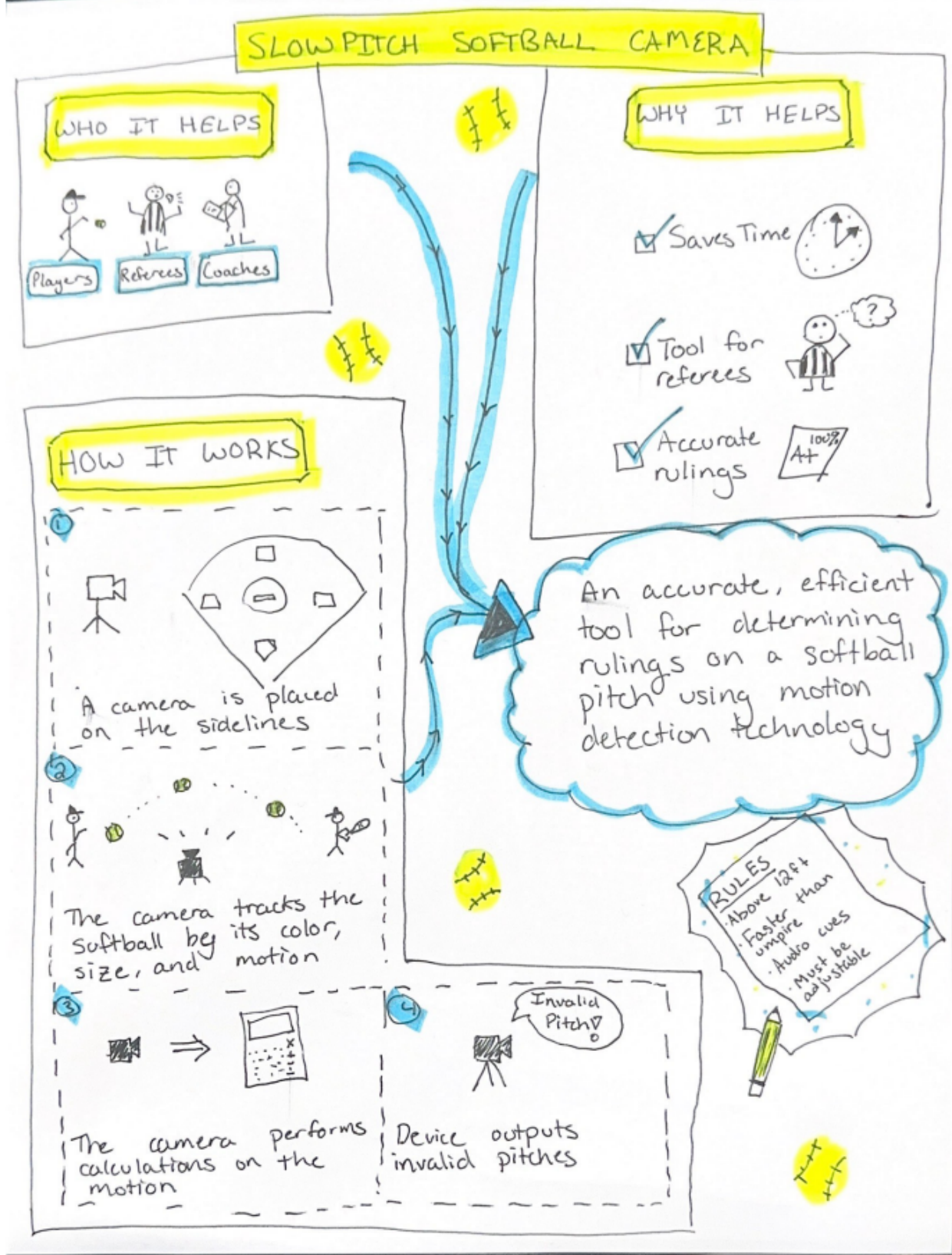
4 person: 6px = 3 px

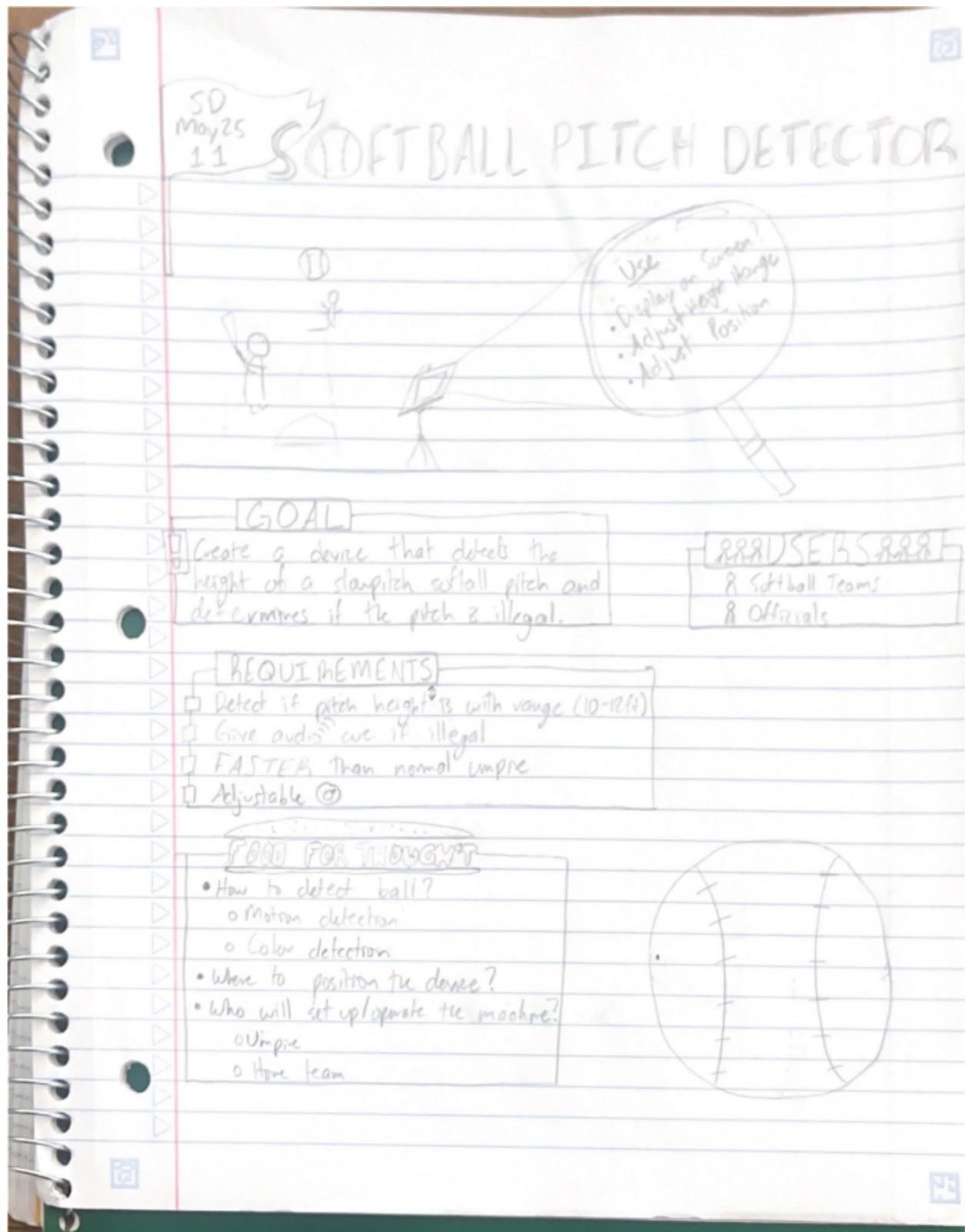
ball: 4 px over ground

Height = $\frac{4}{3} = 1.33px$

= $1.33 * 6 = 7.98'$

Team: 5d may 25-11
Member: Andrew Vick





SOFTBALL SLOW-PITCH PITCH CALLER™

WHY?

Wrong Calls
Fighting
No fun!



Refs vs. Players

SOLUTION!

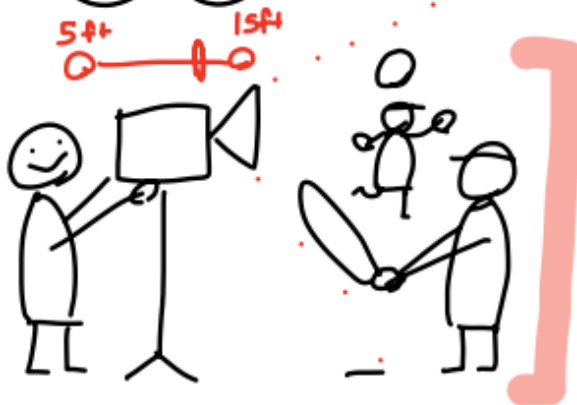
- Pitch Detector
 1. Track ball trajectory
 2. Determine Pitch legality
 3. Report Call!



CONSTRAINTS

↳ **MUST:**

1. Analyze calls faster than a referee
2. Be accurate
3. Be Configurable with UI



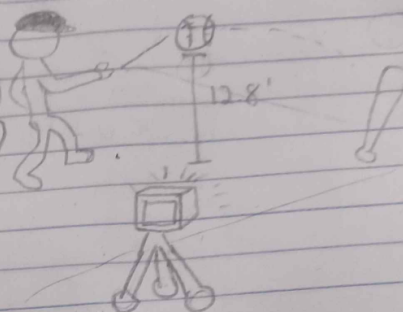
Softball Slowpitch Detector

WHY?

- ☐ Saves Time
- ☐ Easier for Umpires
- ☐ Accurate decisions

WHO?

- ☐ Players
- ☐ Umpires
- ☐ Coaches
- ☐ Fans



REQUIREMENTS!

- Detect if pitch is out of range
- Must give audio cue
- Must be faster than a normal umpire
- Must be adjustable

PROBLEMS!

- Camera needs to know its relation to mound
- Needs to know how to detect the ball
- Be able to detect above 12 feet
- Have the device be consistently accurate

HOW IT WORKS!

- Camera is used on the sideline to track the softball when thrown
- Camera detects and calculates if the pitch is legal or illegal
- Device outputs result if it is an illegal pitch

Goal

To create a device that accurately detects the height of a slowpitch softball pitch and determines if the pitch is illegal