LT6 - Contextualization/Design Check-In

Slow Pitch Softball Detector Team 2 - Pitch Perfect

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Project Overview

Pitch Perfect is a device/app designed to track softball pitches and determine their legality based on height, ensuring fair play, safety, and aiding player development.

Objectives:

- Improve communication of pitch legality to players and coaches.
- Provide umpires with reliable data for consistent decision-making.
- Enhance overall player experience and development in slow-pitch softball.

Artifacts

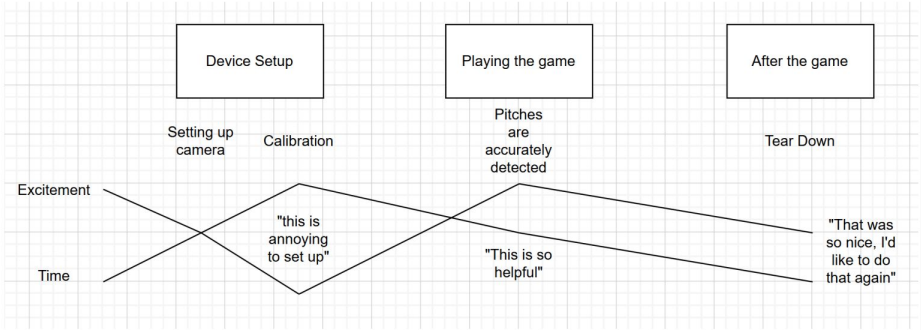
- Pros-cons list
  - It is important that we take into consideration the difficulty of tracking a softball in multiple different types of weather/lighting on a smartphone
- Journey Map
  - It's important when designing we consider the difficulty of setup for our users. Local leagues want this product to be simple to use and work with minimal technical expertise

Pros

Argument	Weight
Is precise to within one ball diameter	3
It is easy to set up hardware (hand the phone up)	4
Addresses the user needs by calling pitches relatively cl	3
Other solutions do not exist	3
More consistent than an umpire	3

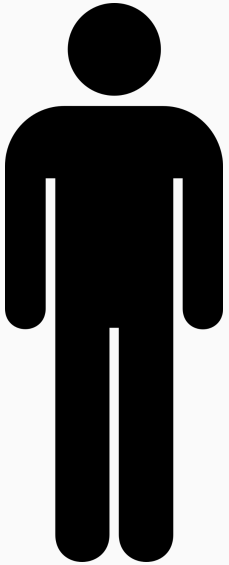
Cons

Argument	Weight
Is not precise to < a ball diameter	1
Is not easy to calibrate	3
Could be affected by Sun	3
Could be too technically complex to process quickly	3
More expensive than an umpire	3



Human

- Users want a more accurate method for detecting illegal pitches in slow-pitch softball
  - Our solution will have to be more accurate than the average slow-pitch softball umpire
- The result of if a pitch is illegal or not should be clearly and quickly known by the user
  - Using both an audible sound and a light to indicate if a pitch is legal/illegal

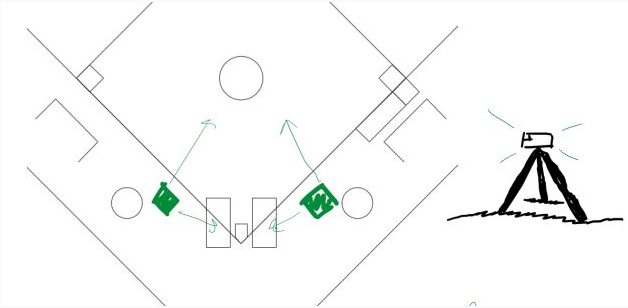


Economic

- Other specialized solutions cost hundreds to thousands of dollars
  - Not viable for a local slow-pitch softball league
- Our solution is low-cost with only a fence mount and a phone needed
- The drawback with our approach is overall accuracy otherwise gotten through an expensive highly-calibrated system. But with our system we tap into a new market of smaller budget leagues

Technical

- Targeted our design to be simple and easy to set up
- Using multiple methods of tracking within OpenCV to detect the softball's travel in frame
  - Color mask
  - Frame differential (motion)
  - MOSEE/KCF
- Using QT for frontend development to integrate with OpenCV and use C++ for faster processing times



Conclusion

There is much to consider for our project, we want it to be simple for our users, but also able to accomplish the tasks we have set out for our team. We want it to be technically accurate, but not require extensive resources or a large cost. It is a balance to be sure, but one we are considering in each step of our design process to ensure a quality final product.