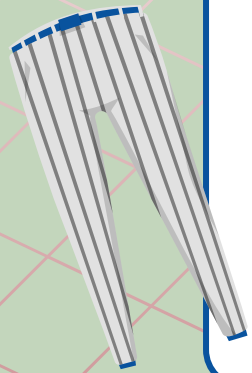
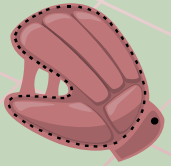
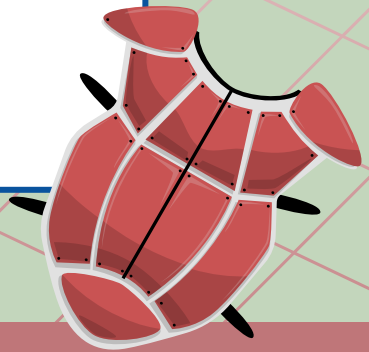




Weekly Updates

Slow-Pitch Softball Detection | SDMAY25-11

This Week's Progress

C++ Scripts

- Translating python scripts
- Running C++ scripts within Flutter

ML vs NML

- MOSSE scripts
- ML detection

Distortion

- Undistortion of camera lens
- Calibrate-once method

C++ Scripts

- Translated current Python detection scripts into C++
  - Python scripts are not fully functional
  - Implement OpenCV and camera operations for testing

- Added Flutter capabilities to run C++ scripts on mobile.
  - Can basic cpp “Hello World” files

MOSSE Scripts (NML)

- Minimum Output Sum of Squared Error
- Object tracking using correlation filters to detect patterns and tendencies.
- Create a template and add filters to find an object detection algorithm with the minimum output sum.
- Inconsistent in different lighting. Not as reliable.

Machine Learning vs Non-Machine Learning

Can adjust the implementation based on the environment

Slower

Customized training models

Higher Accuracy

Machine Learning

Difficult handling of environmental variables

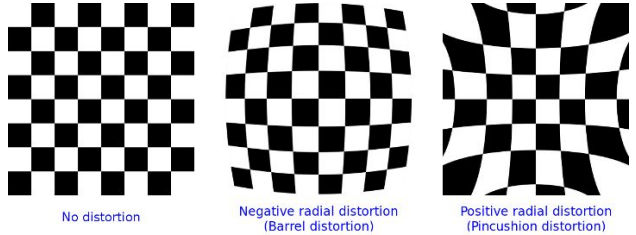
Fast execution

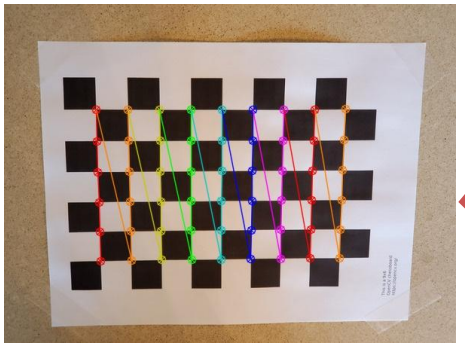
Less Complex

Non-Machine Learning

Lens Distortion

- OpenCV Distortion Detection
  - Uses a checkerboard to find distortive patterns
- Live camera calibration
  - 15 captured photos
  - Side by side display
- File Storage
  - Saves the distortion details locally in a file to be used later.
- Future: Create a CameraManager class to use OpenCV, but automatically undistort with .read()





Next Week?

- Continue translating visual/camera components in C++.
- Integrate calibration techniques into current object detection script.
- Continue testing/prototyping height detection scripts
- Begin Flutter screen development.

Questions?

GitHub
Google Drive