Practical Course AI Status Sprint 7

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Preprocessing (AN)

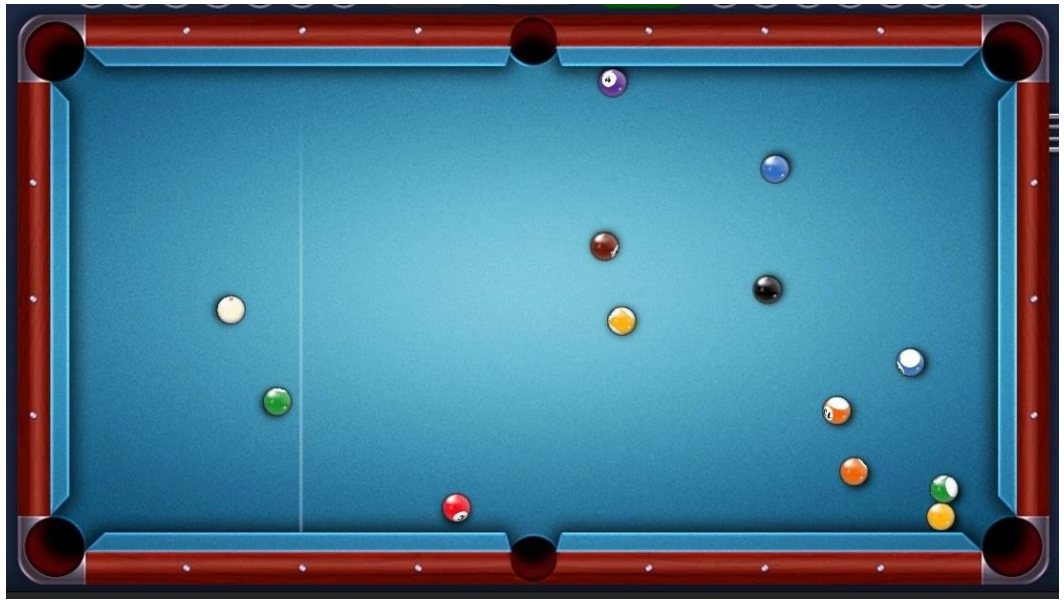
- Readjusted HSV color ranges to improve accuracy of color detection
- Used gamma correction for image and color enhancement
- Added a workaround in code to use inner-rectangle

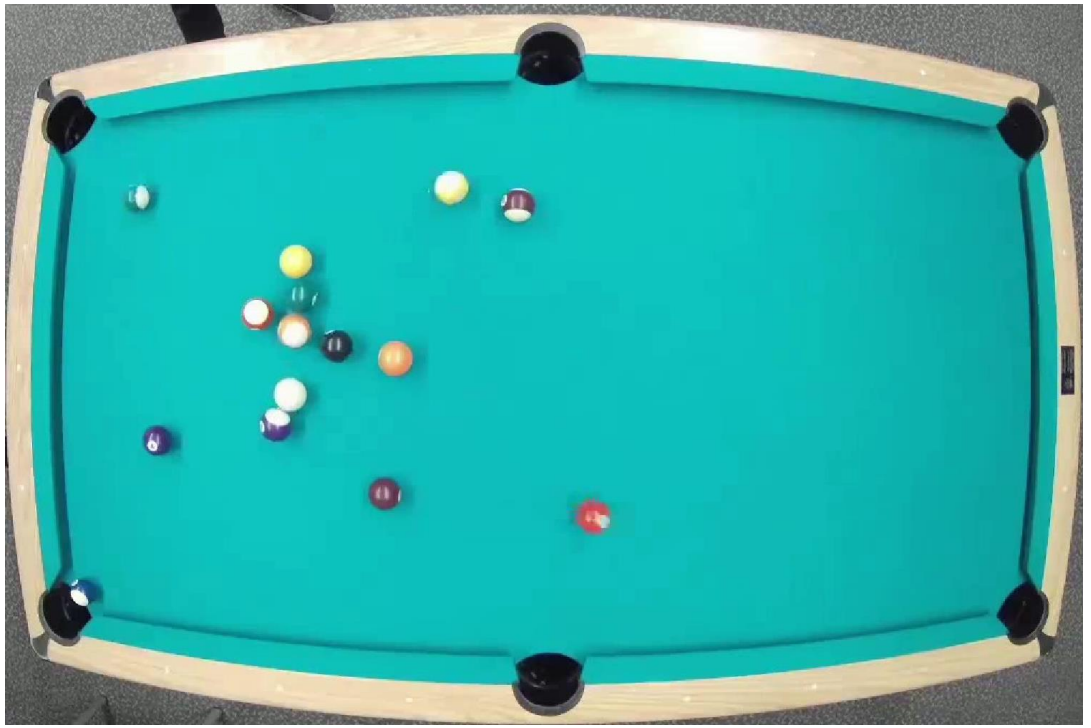
Currently:

- Developing logic for filtering to improve consistency in detection of different ball positions even when the color/circle detection in a frame fails.

Challenges with real data (TM)

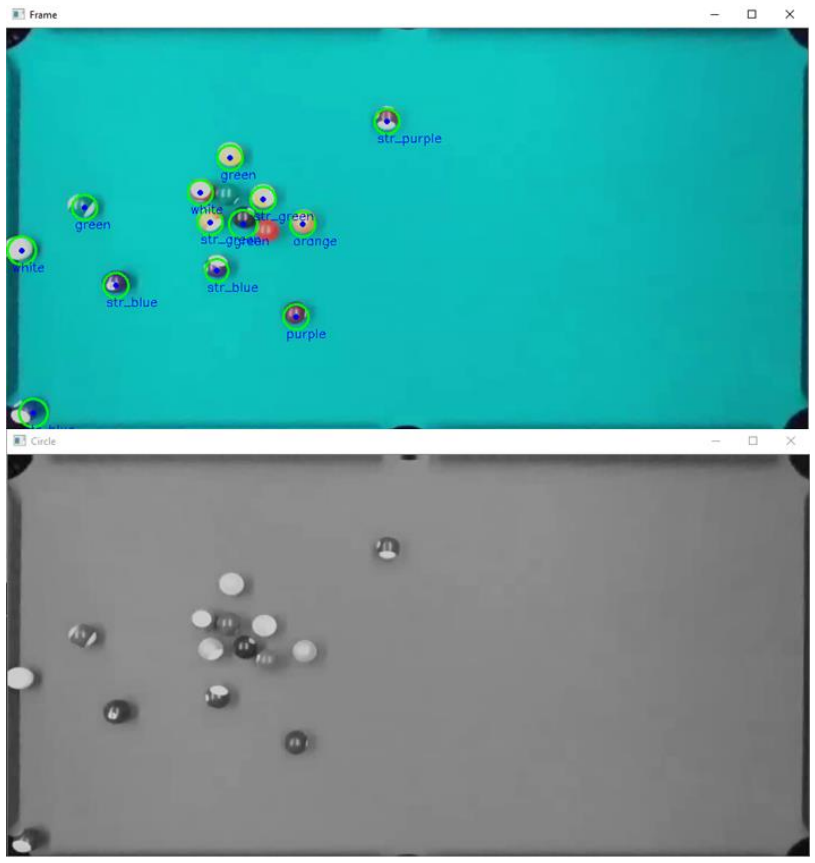
- Motion artefacts → Nonlinear filters
- Green on green → No Hue segmentation
- Elongated balls → Tune Circle Hough
- Shadows → HSV



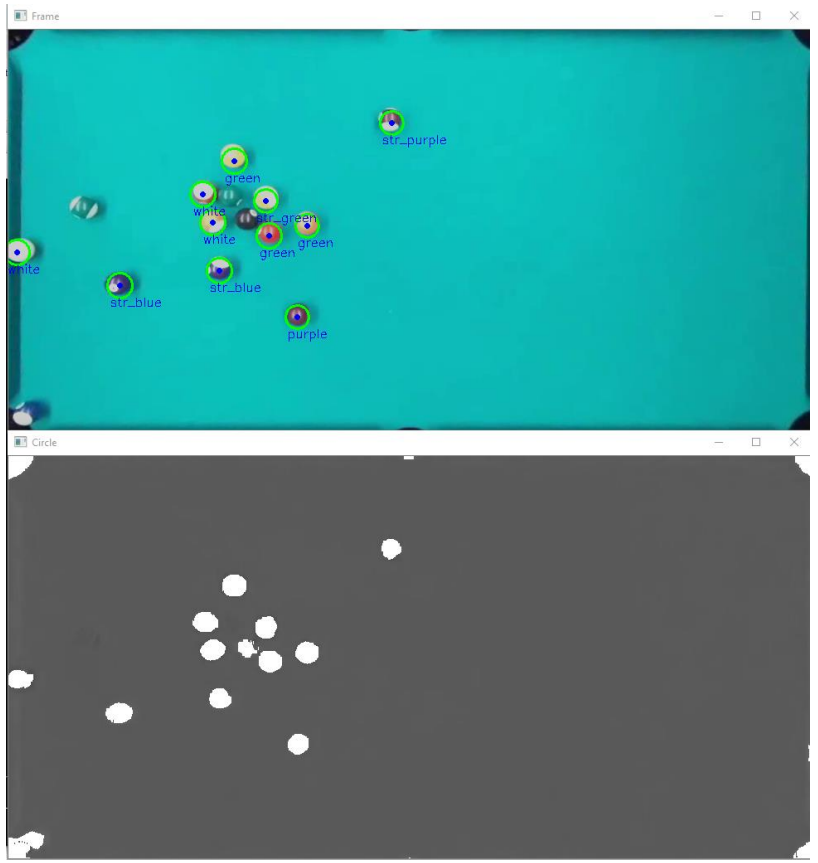


Segmentation Strategies (TM)

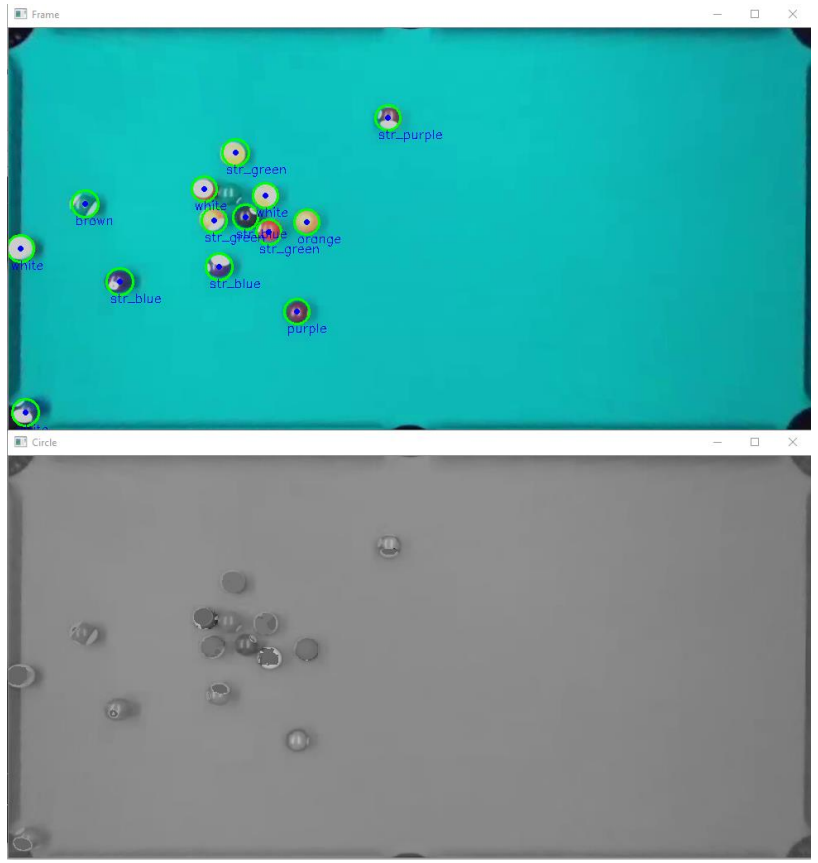
RGB



Hue



HSV



Software Architecture (ZC, TM)

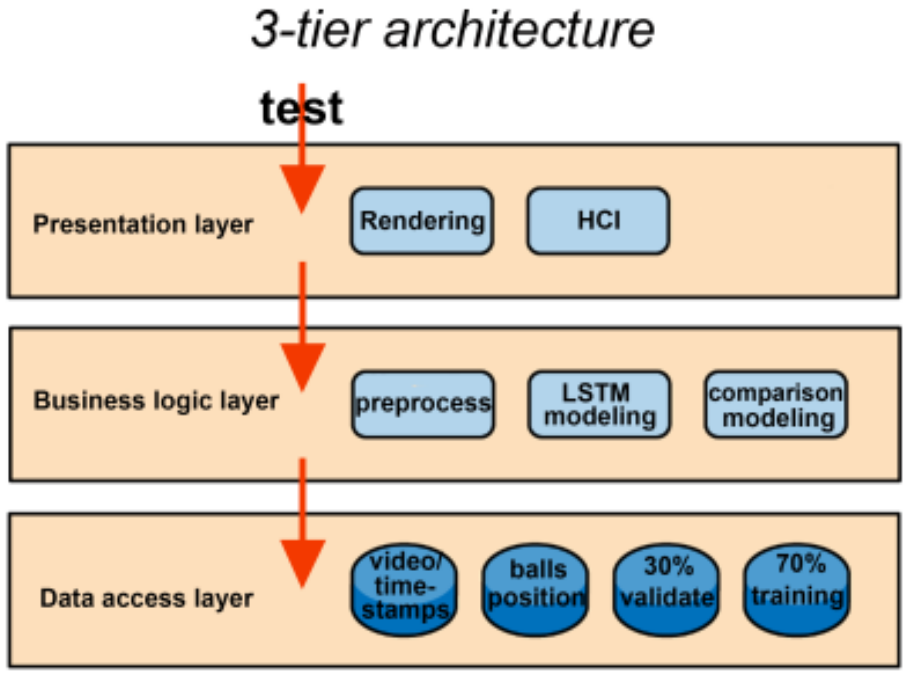
In order to realize 'High cohesion & Low coupling', it is useful to seperate the software into a multi-tier framework.

'High cohesion': a module consists of codes which are very cohesive with each other and responsible of a single task, which is Single Responsibily Principle.

'Coupling': the measurement of connectivity of different modules within a same software. 'Low Coupling' means module should be more independent from each other.

So we should seperate a big module into several independent ones and then the interfaces between modules should be easy as possible.

less global varibles, one function does one job



- Clear interface definitions
- One framework to call components

Integration (SG, SB)

- Based on concepts of software architecture
- Put individual components together
- Used inference pipeline as baseline
- Integrated modeling and visualization codes

Outlook

- Improve segmentation (nonlinear diffusion techniques)
- Implement filtering for ball detection
- Finalize dataset
- First experiments with model using dataset