Practical Course AI
Status Sprint 16

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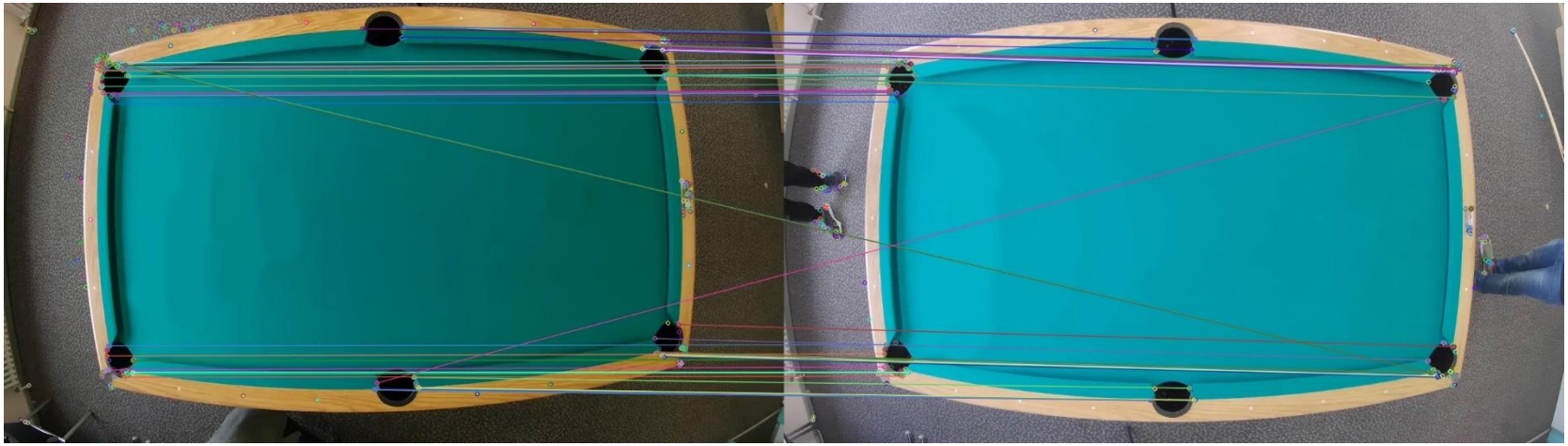
Process test video (ZC)

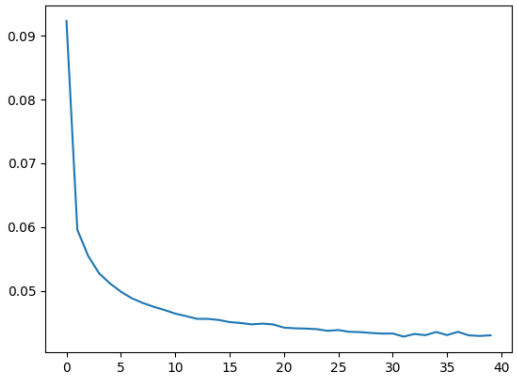
- Calculate homograph matrix between train video and test video
- Finish alignment of test video



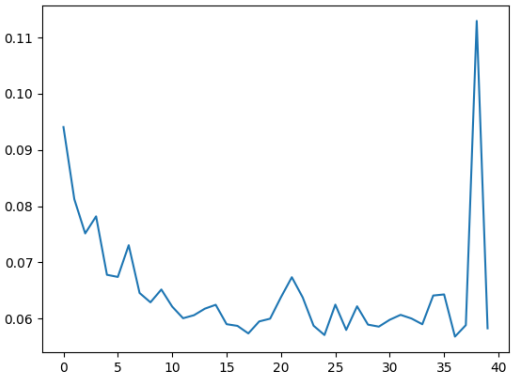
Dataset Cleaning (AN, TM)

- White ball must be detected
- Ball is not allowed to disappear and reappear
- Ball can only change its position within a limited distance per step
- → 1800 CSVs remaining

train loss



validation loss

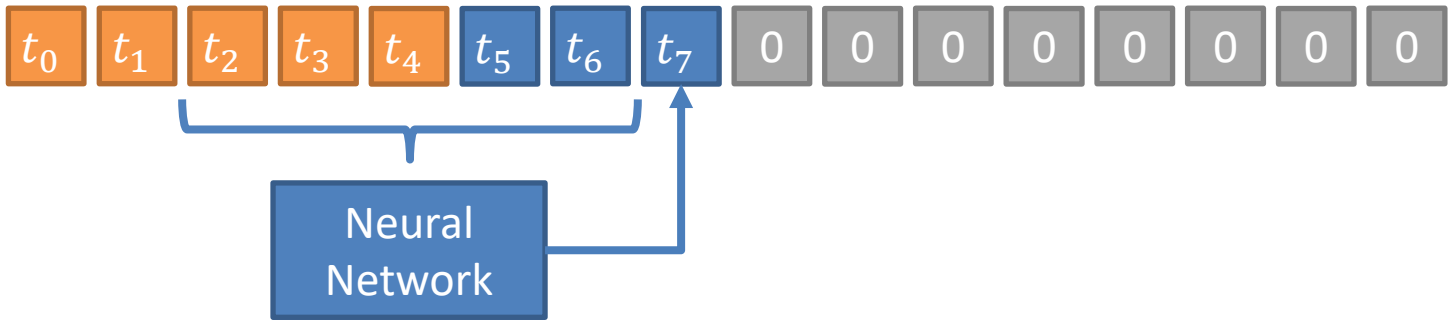


Prediction Loop (SB)

- Changed multistep prediction during training to avoid using unnecessary predictions
- Worked on prediction loop and tested different numbers of prediction steps for performance

Refactoring of Prediction Loop (TM)

- Frame buffer
  - Initialize full buffer with zeros
  - Keep frame buffer on GPU
  - Sliding window (indexing) defines
- Better intuition and tracability
- Efficient data handling



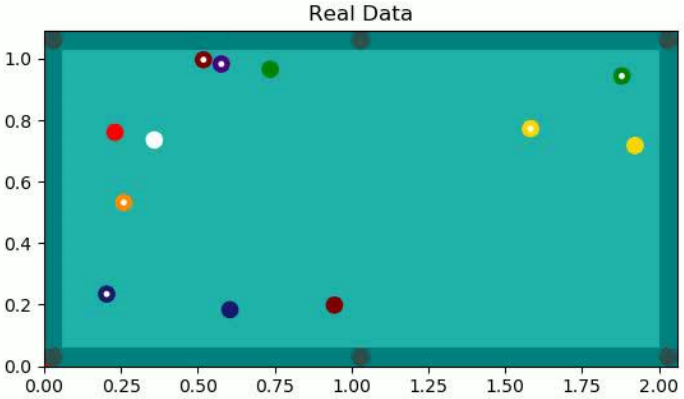
Baseline Linear Model (AN)

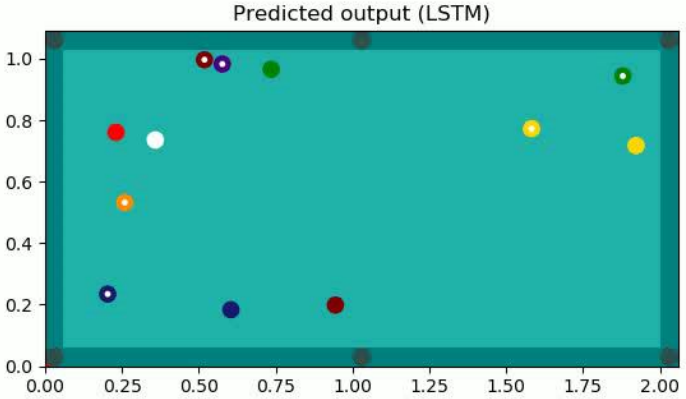
- Integrated ball existence logic in training
- Trained with 200 epochs, process getting killed after ~80 epochs

LSTM Model & Training (TM)

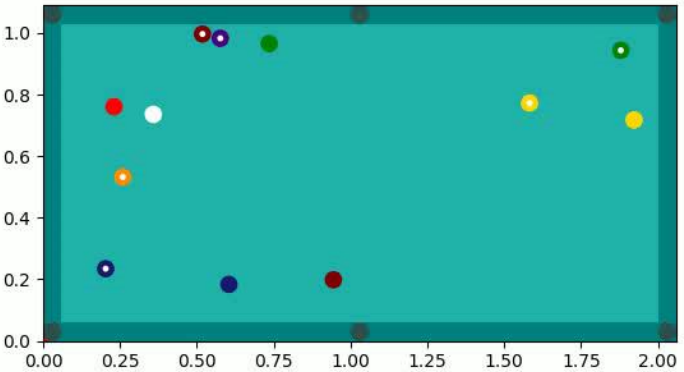
- Change BaseNet to implicitly predict relative positions and add offsets to output absolute positions again
- Change loss to include deviation over all prediction steps
- Integrate ground truth each k steps to make network learn long-term dependencies
- Predicted positions of non-existing balls not considered in loss

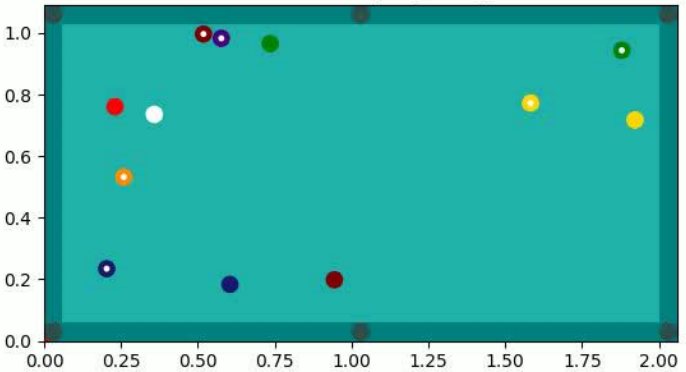
LSTM
Full
prediction



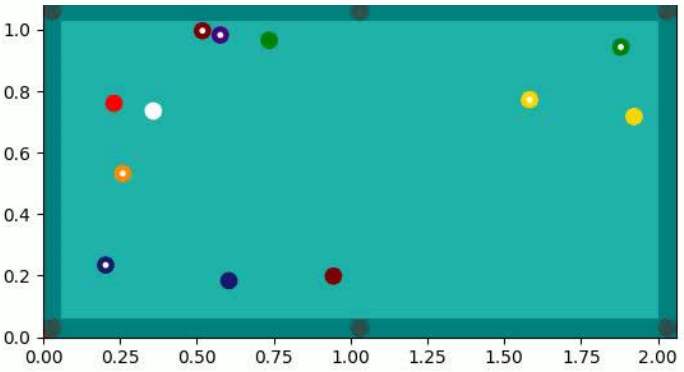


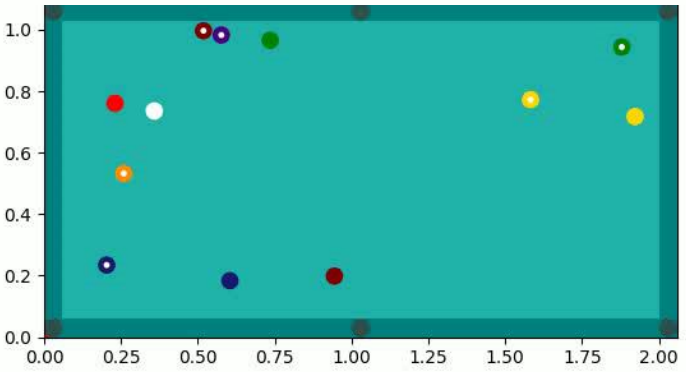
LSTM
10-step
prediction





Linear
10-step
prediction





Rendering (SG)

- Fixed bugs in rendering
- Modified rendering to not display balls that are not on table

Outlook

- Capture non-linearity in training
- Create evaluation report
- Prepare presentation