



University of Stuttgart
Germany

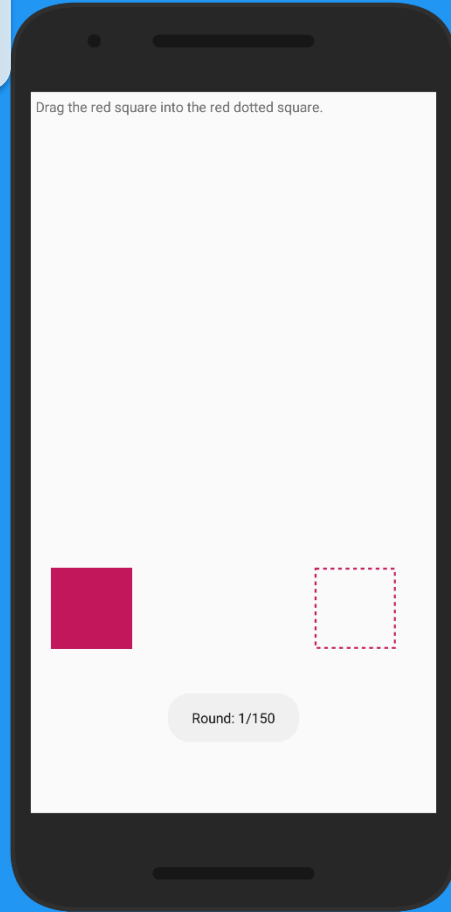
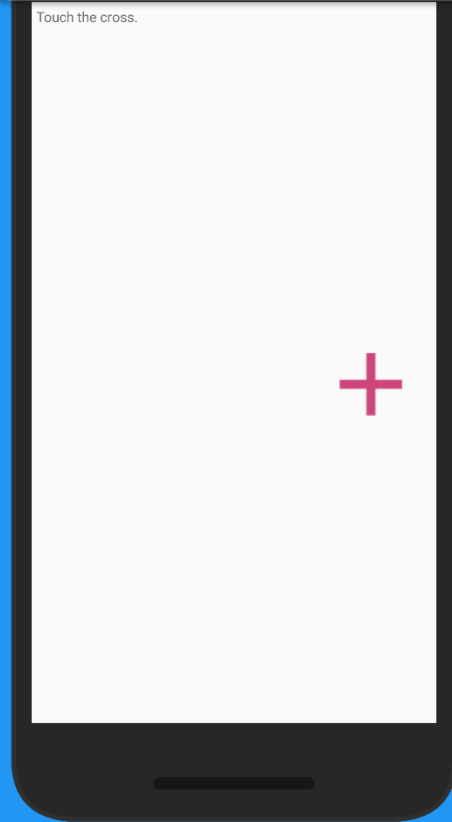
Simple Touch Prediction With Built-In IMUs

Intermediate Presentation

Felix Bühler, Benedict Steuerlein

FaPra Machine Learning and Computer Vision for HCI | Pfaffenwaldring 5a | 08.01.19

Current Status



- Carried out study with 18 participants
- Still need 2 participants!

Current Status

For 18 participants on one phone:

- 12 GB in RAM

We will have 20 participants and four phones:

- 52 GB in RAM

Limited by hardware!

Data generator reading hdf5 files from hard drive

- Slower, but almost no RAM utilization

Preprocessing

- ✓ Segmentation
- ✓ Remove duplicates
- ✓ Sensor data alignment
- ☐ Data generator
- ☐ Model training

Current Status

Trained our first model

- Only for Nexus 5X
- 18 participants (13 train – 5 test)

After 240 epochs (10 days, 5h)

- Euclidean distance between actual touch and predicted touch: 63.51 mm

Hint from Sven that our loss function is calculating the mean instead of RMSE

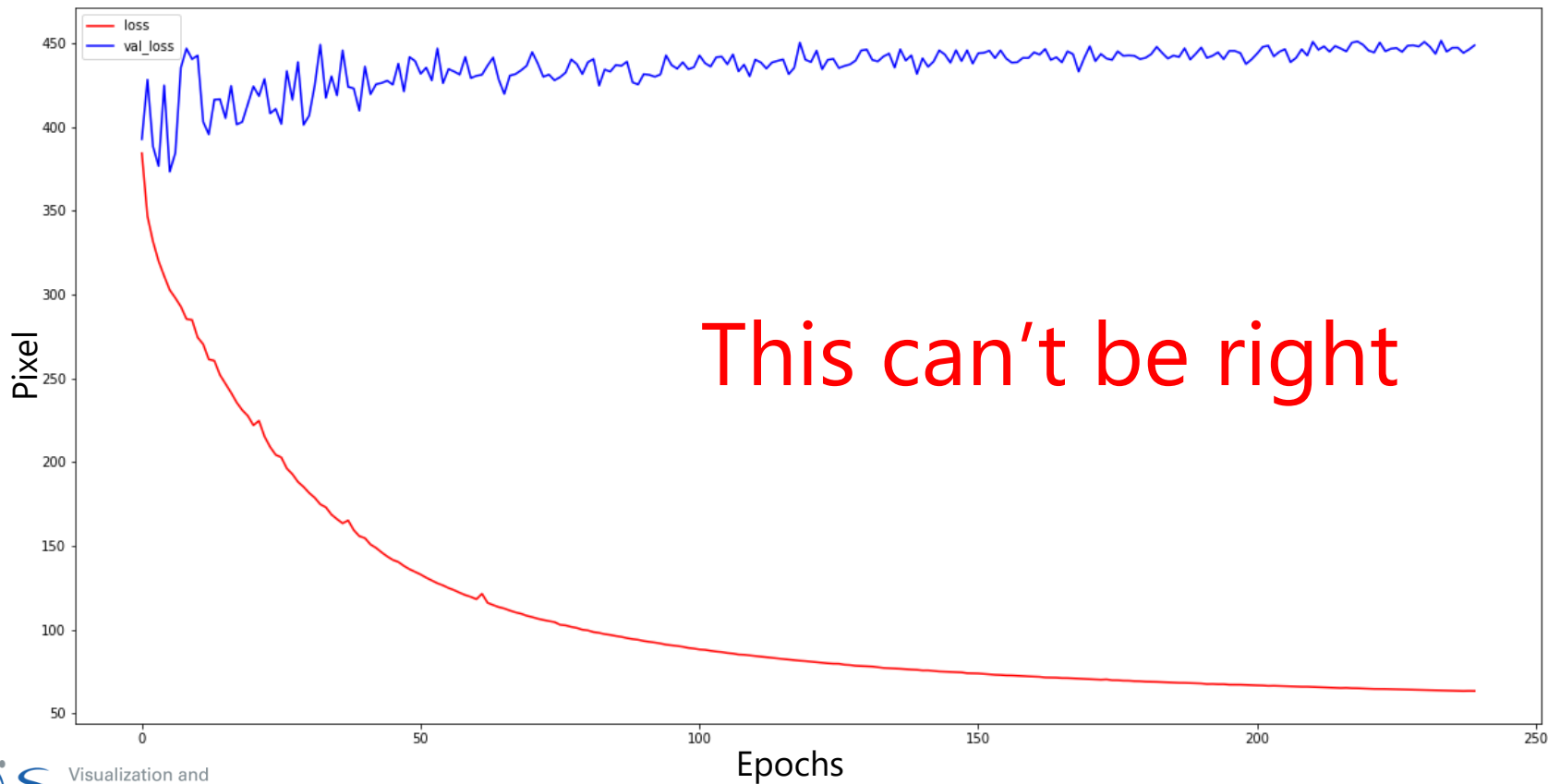
(thank you, stackoverflow)

➤ Repeat training with correct loss function

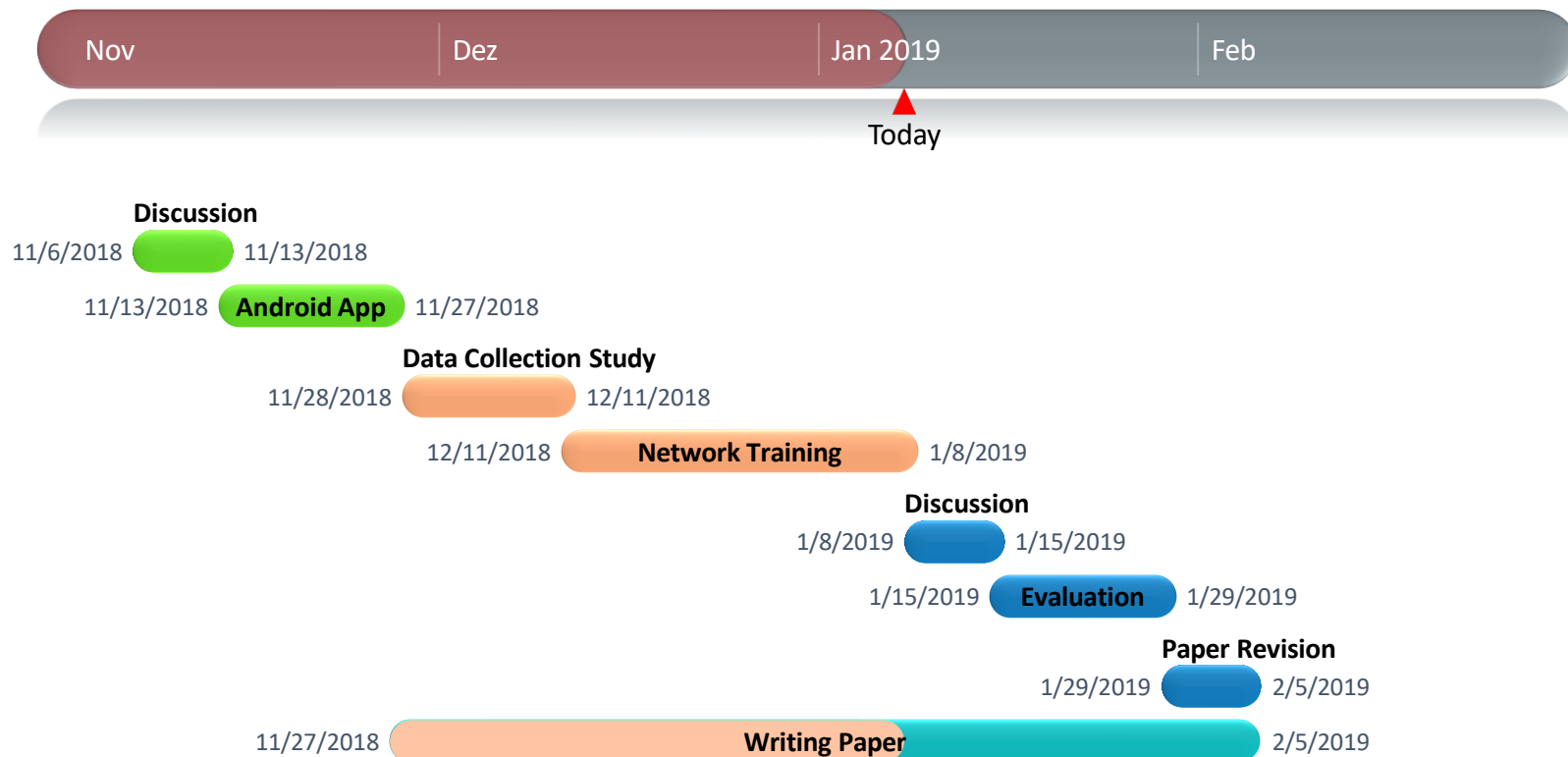
Preprocessing

- ✓ Segmentation
- ✓ Remove duplicates
- ✓ Sensor data alignment
- ✓ Data generator
- ☐ Model training

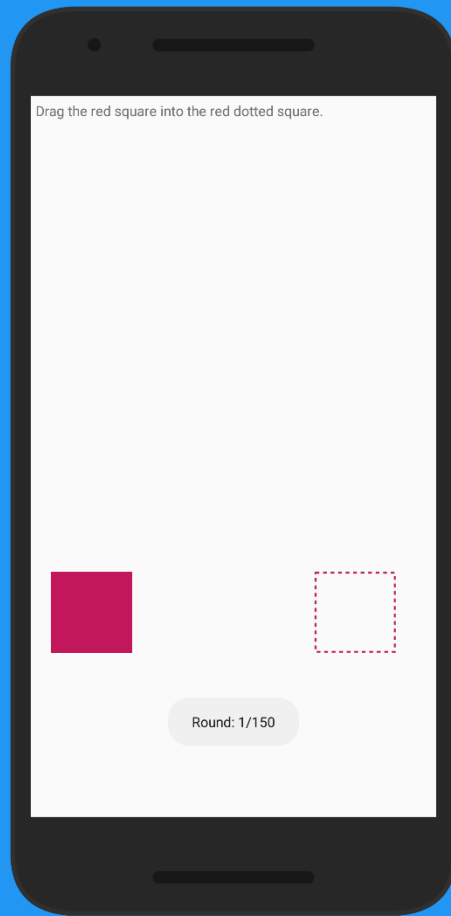
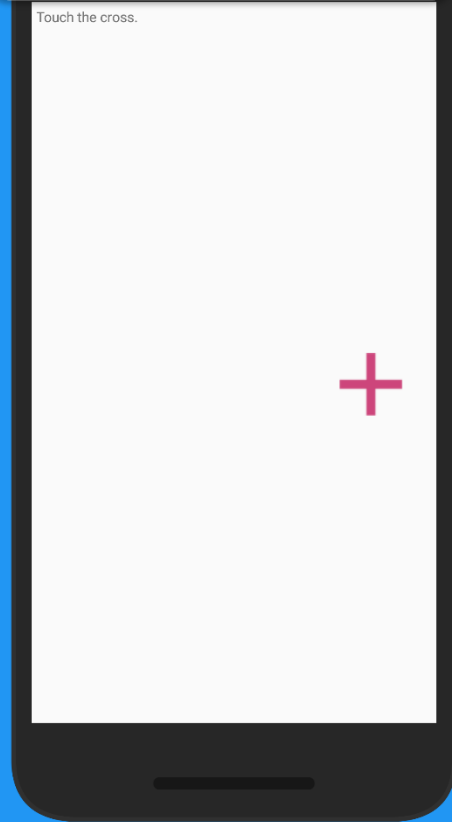
Model Accuracy



Agenda



Questions



- Currently only using window size of 150ms (50 samples) due to data.
- What could be wrong?
- Should we switch to classification instead of regression?