University of Stuttgart
Germany

Simple Touch Prediction With Built-In IMUs

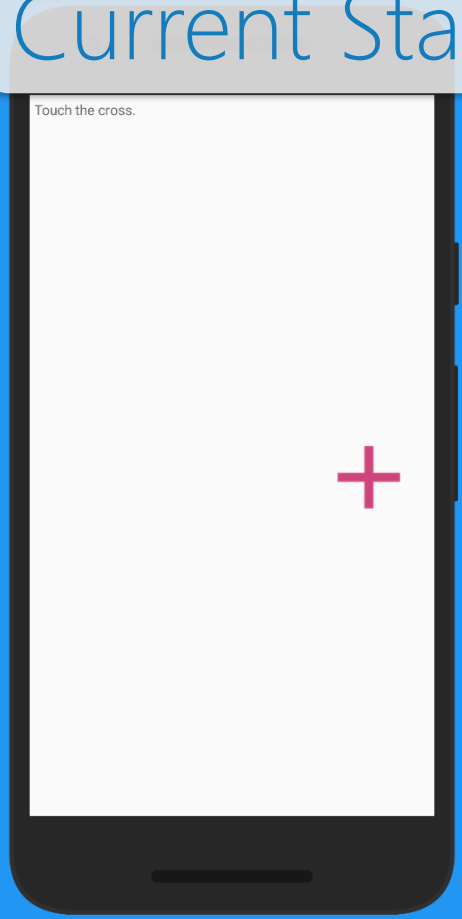
Intermediate Presentation

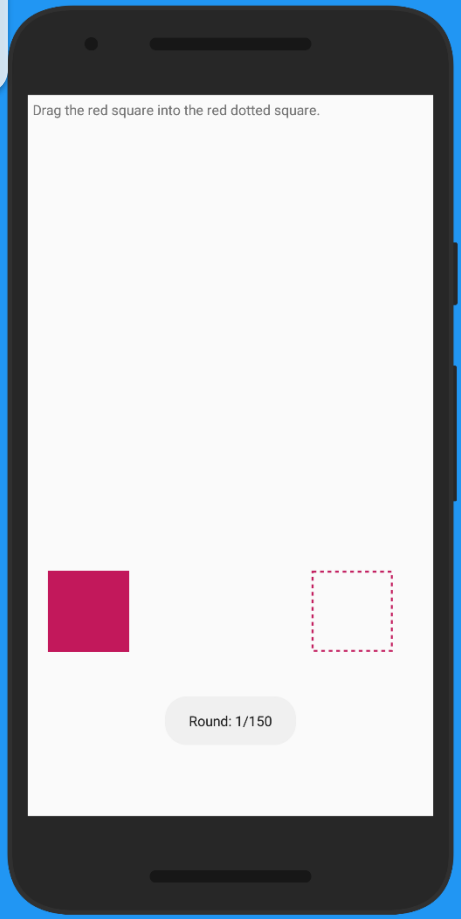
Felix Bühler, Benedict Steuerlein

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

Visualization and
Interactive Systems Institute

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 predicited touch: 5.389 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

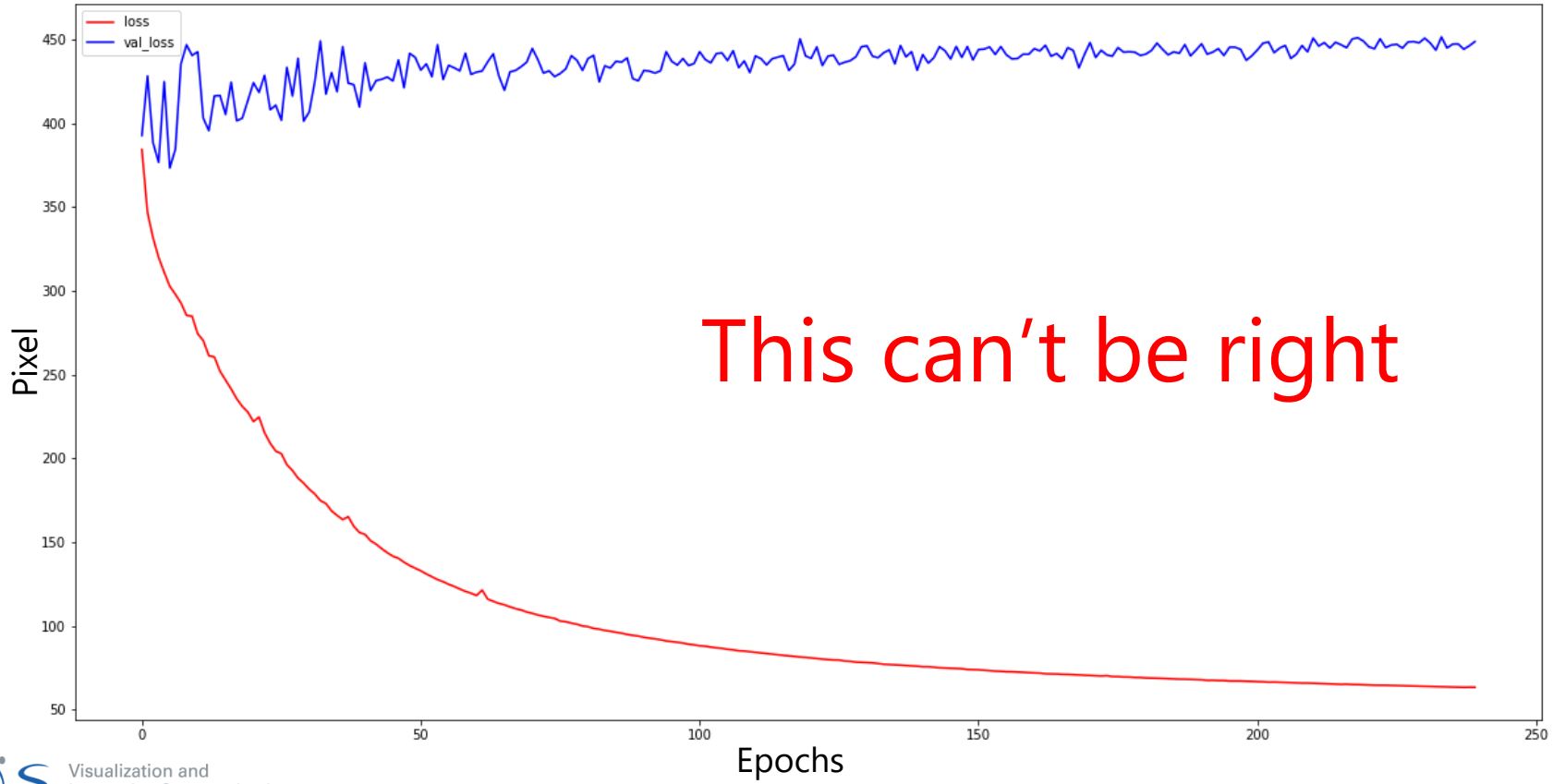
✓ Remove duplicates

✓ Sensor data alignment

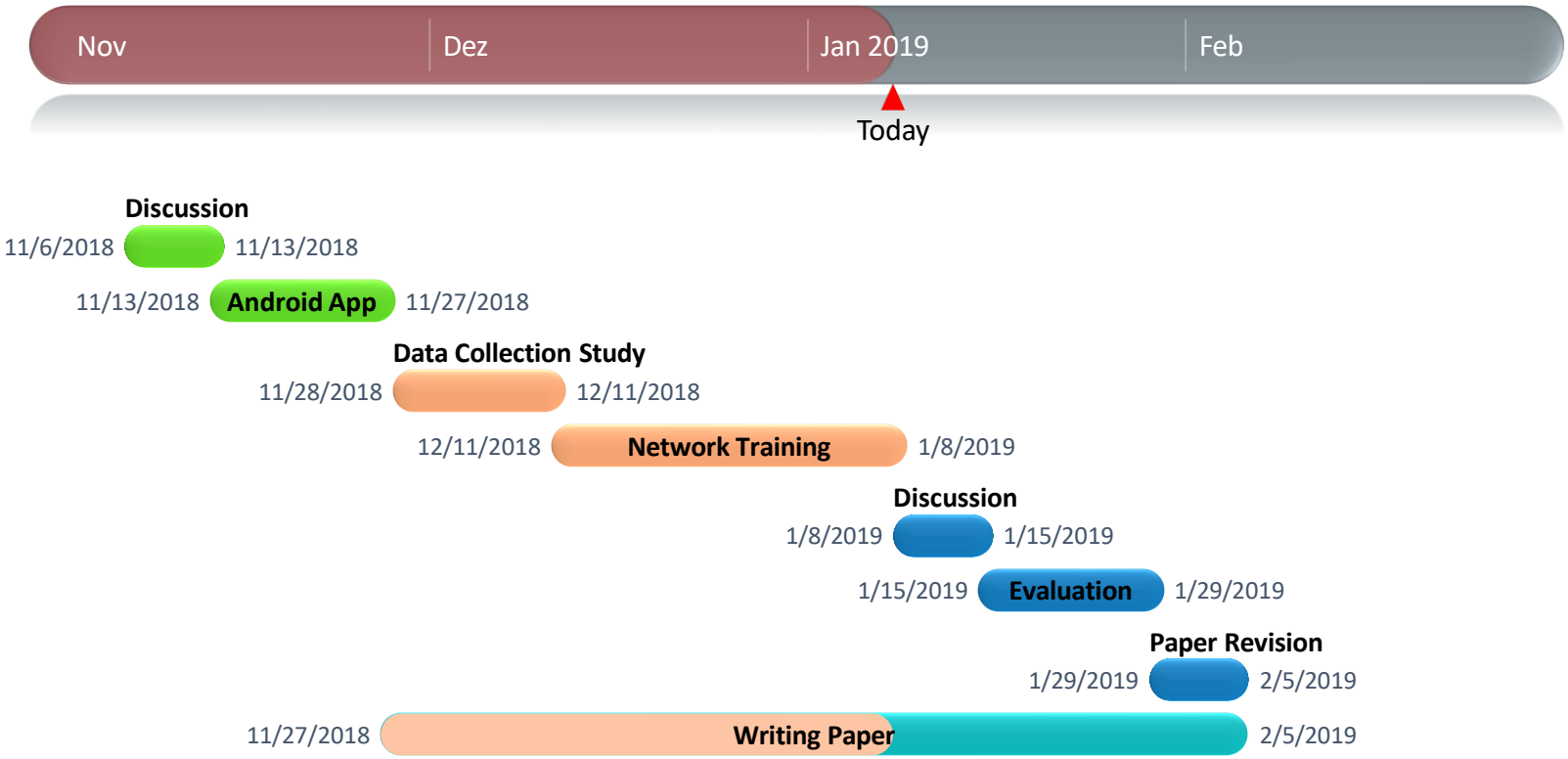
✓ Data generator

❑ Model training

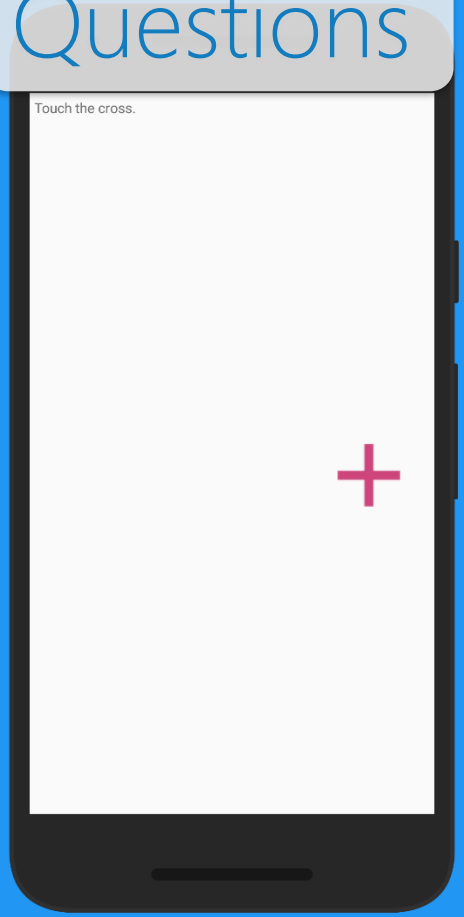
Model Accuracy

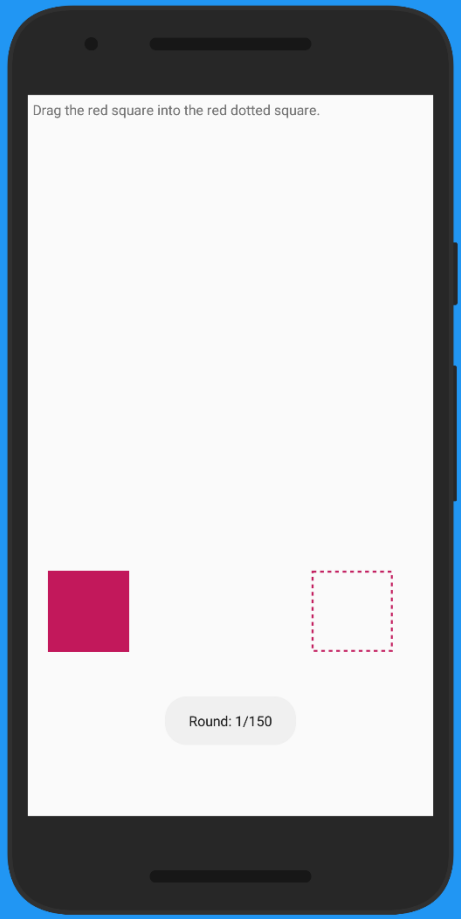


Agenda


Nov
Dez
Jan 2019
Feb
Today
Discussion
11/6/2018
11/13/2018
11/13/2018
Android App
11/27/2018
Data Collection Study
11/28/2018
12/11/2018
12/11/2018
Network Training
1/8/2019
Discussion
1/8/2019
1/15/2019
1/15/2019
Evaluation
1/29/2019
Paper Revision
1/29/2019
2/5/2019
11/27/2018
Writing Paper
2/5/2019

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?