Title: Front Slow Mo

Description: 1st serious testing of deeplabcut.

Video (training): 1080p, 240 fps, with color. From the front. Includes some pellets at the bottom. Around 90 seconds realtime. 940 MB

Log File: Desktop/DeepLabCut/examples/time\_logfrontslomo.txt

Date:6/01 – 6/06

**INITIAL TRAINING:**

1. Initialization (Pose Config):
   1. Training Fraction: 0.95
   2. Body Parts: [LeftHand, RightHand, Nose, Pellet]
   3. Crop: None, 1980 by 1080
   4. Directory: Desktop/DeepLabCut/frontslowmo-vj-2019-06-05
   5. ipynb: Desktop/DeepLabCut/examples/1080p240fps
2. Frame Extraction:
   1. Function Call: extract\_frames(path\_config\_file,'automatic','uniform',crop=False)
   2. Number of Frames: 200
3. Frame Labeling:
   1. Comments (frames skipped, ambiguity, labels):
      1. Skipped ~30 frames (frames without mouse)
      2. Included frames where labeled parts not in view
      3. Not too much ambiguity, nose best labeled, not much pellet labeling
4. Train Network:
   1. Function Call: train\_network(path\_config\_file, saveiters=1000, displayiters=100, maxiters=300000)
   2. Network Iteration: first, iteration-0
   3. Training Dataset: original labeled frames
   4. Continuation: N/A
   5. Number of Iterations: 30k
   6. Time Elapsed: 80 minutes
5. Evaluate Network:
   1. Iteration: 1st, iteration-0
   2. Train: 3.2 pixels
   3. Test: 44.2 pixels
   4. P-cutoff = 0.1
   5. Train with p-cutoff: 3.2
   6. Test with p-cutoff: 18.41
6. Analyzing Videos:
   1. Videos:
      1. Frames: 15.5k
      2. Frame Size:
      3. Time Elapsed:
7. Created Labeled Video:
   1. Time Elapsed: 20 min?
8. Results: Not bad, frames without the body parts are poorly labeled as expected.
9. Comments:

**RETRAIN #1**

1. Extract Outlier Frames:
   1. Video: Original
   2. Algorithm: Jump
   3. Parameter: don’t remember
   4. Number of Frames: around 30
2. Refine Labels:
   1. Comments (frames skipped, ambiguity, labels):
      1. Includes clock
3. Train Network:
   1. Function Call: train\_network(path\_config\_file, saveiters=1000, displayiters=100, maxiters=300000)
   2. Network Iteration: second, iteration-1
   3. Training Dataset: original labeled frames + 1st extraction (includes clock time)
   4. Continuation: N/A
   5. Number of Iterations: 30k
   6. Time Elapsed: 80 minutes
4. Evaluate Network:
   1. Iteration: 2nd, iteration-1
   2. Train: 6.7 pixels
   3. Test: 30.65 pixels
   4. P-cutoff = 0.1
   5. Train with p-cutoff: 6.7
   6. Test with p-cutoff: 30.65
5. Analyzing Videos:
   1. Videos: Original Vide0
      1. Frames: 15.5k
      2. Frame Size:
      3. Time Elapsed: 20 min
6. Created Labeled Video:
   1. Video: Original
   2. Time Elapsed:?
7. Results: No random points during clock time. Unable to tell quality of novel frame labeling
8. Comments:

**RETRAIN #2**

1. Extract Outlier Frames:
   1. Video: Original
   2. Algorithm: Jump
   3. Parameter: don’t remember
   4. Number of Frames: around 30
2. Extract Outlier Frames:
   1. Video: Original
   2. Algorithm: uncertain
   3. Parameter: 0.0002
   4. Number of Frames: around 30
3. Refine Labels:
   1. Comments (frames skipped, ambiguity, labels):
      1. Includes clock
      2. Not entirely sure of labeling accuracy
4. Train Network:
   1. Function Call: train\_network(path\_config\_file, saveiters=1000, displayiters=100, maxiters=300000)
   2. Network Iteration: 3rd , iteration-2
   3. Training Dataset: original labeled frames + 1st and 2nd extraction (includes clock time)
   4. Continuation: N/A
   5. Number of Iterations: 30k
   6. Time Elapsed: 80 minutes
5. Evaluate Network:
   1. Iteration: 3rd, iteration-2
   2. Train: 12.5 pixels
   3. Test: 32.18 pixels
   4. P-cutoff = 0.1
   5. Train with p-cutoff: 12.5
   6. Test with p-cutoff: 32.18
6. Analyzing Videos:
   1. Videos: Original Vide0
      1. Frames: 15.5k
      2. Frame Size:
      3. Time Elapsed: 20 mins?
7. Created Labeled Video:
   1. Video: Original
   2. Time Elapsed:?
8. Results: Random points reappeared during clock time. Unable to tell quality of novel frame labeling
9. Comments:

**TEST COMPRESSED VIDEO ANALYSIS SPEEDS**

1. Analyzing Videos:
   1. Video:
      1. FFMPEG Compression Factor: 50
      2. Size: 11.4 mb (original: 940mb)
      3. Frames: 15.5k
      4. Frame Size: 1920 1080
      5. Time Elapsed: 20 mins?
2. Analyzing Videos:
   1. Video:
      1. FFMPEG Compression Factor: 30
      2. Size: 50.5 mb (original: 940mb)
      3. Frames: 15.5k
      4. Frame Size: 1920 1080
      5. Time Elapsed: 20 mins?
3. Analyzing Videos:
   1. Video:
      1. FFMPEG Compression Factor: 27
      2. Size: 88.4mb (original: 940mb)
      3. Frames: 15.5k
      4. Frame Size: 1920 1080
      5. Time Elapsed: 20 mins?

Final Thoughts:

Compression doesn’t increase analysis speed?

Things to Try:

More Compression experiments. Batch Size experiments. 0.9 training set fraction

Next Steps:

Train original network much more, run overnight. Try more compression and batch size experiments. Test and confirm logging code. Wait for more behavioral videos to try. Work more with git.

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1. Comments: added timer to keyboard inputs. Network failed to train overnight because it got stuck at the input.
2. Created Labeled Video:
   1. Video: compressed 50
   2. Time Elapsed:3min14
3. Created Labeled Video:
   1. Video: compressed 30
   2. Time Elapsed: 3 min 31
4. Created Labeled Video:
   1. Video: compressed 27
   2. Time Elapsed:3min 36
5. Created Labeled Video:
   1. Video: compressed 20
   2. Time Elapsed:3min55
6. Data Wrangling:
   1. Comments:
      1. Played around with using h5 file, selecting rows, plotting a bit
      2. Can see patterns and movements through plots
7. Train Network:
   1. Function Call: train\_network(path\_config\_file, saveiters=1000, displayiters=100, maxiters=300000)
   2. Network Iteration: continuation of 2nd network
   3. Training Dataset: original labeled frames + 1st and 2nd extraction (includes clock time)
   4. Number of Iterations: 300k
   5. Time Elapsed: 12 hours 45 minutes
8. Evaluate Network:
   1. Iteration: 300k continuation of 2nd network
   2. Train: 1.7 pixels
   3. Test: 21.37 pixels
   4. P-cutoff = 0.1
   5. Train with p-cutoff: 1.7 pixels
   6. Test with p-cutoff: 13.19

6/10/19:

1. Tra

Things to Try:

Data wrangling with the hands and pellets

Next Steps:

crho

Work on +/- with pellets!!!

PANDAS objective: remove jumps in data/identify wrong points. Identify successes and failures. Quantify mouse movement ability/how damaged nerves are. What constitutes a fail?

6/17/19

**Attempt at using frontslowmo network on novel go pro video:**

1. Comments:
   1. No training, yes cropping
   2. Results: complete failure, almost non-existent tracking
   3. Potential Factors: frame size, slightly different frame cropping, blurriness, lighting conditions, etc