Work Journal

Friday, May 18, 2018 4:58 PM

Recap

- 5/17: Studied Scala/Spark. Started messing around in scala/spark's new Machine Learni
- 5/18: Started messing around with SuperSensor data! Learned some scala df code.
- 5/21 Installed Breeze library and got the FFT to work in scala!
- 5/22 Learning the FFT analysis in python. Got mandatory training done.
- 5/23 (Party) Successful test run analysis.
- 5/24 Found some code to recover amplitudes. Think this might work!
- 5/25 Recovered Amplitudes. Most code in scala is done! Tests are successful
- 5/29: Made a function to FFT in scala!!!!
- 5/30: Got connected with Git. Found out camera job was finished. Supersensor data is r
- 5/31: installed OpenCV library,
- 6/1: Got camera finnaly working on console
- 6/2: Going through bounding box / person detection code. Problems connecting to serv
- 6/3 Server is back up. Started looking at bounding boxes (complicated code) and
- 6/6 Learning Open CV library. Got it to display static image in demo. Messy though
- 6/7 Got facial detection to work on single images.
- 6/8 Got demo working with facial box recognition for static images!!!
- 6/9 Lots of work changes. Maybe got pycharm working?! Focus: Video stuff!
- 6/10 Went through some OpenCV tutorials. Got an image mask working
- 6/11 Busy day of non-work stuff. Researched HSV color scale and thresholding tutorials.
- 6/14 Learned more about Thresholding. More non-work related stuff happened this we
- 6/15 Learned about thresholding and convolusions and cross-correlations. Very cool.
- 6/18 Learned about CNN with relation to images. Canny edges, and noise eliminators. A
- 6/19 Learned how slider bars work, and Hough Line transforms. Started bounding boxes
- 6/20 Learned Quantization w/kmeans and met w/group.
- 6/21 Finished tutorials (motion detection)
- 6/22 Went hard on facial recognition in livestream and bbox grouping
- 6/25 Learned about Histogram Equilization and template matching. Got text to appear o
- 6/26 Improved bbox merge clustering on livestreams. Ran some tests on vivint data and
- 6/27 Full Body Pedestrian detection on video and even does back of head!!! Does decen
- 6/28 Ran some more tests on videos. Downloaded/resized face images of employees fo
- 6/29 Downloaded a crap ton of images on website for demo.
- 7/2 Able to successfully convert .cgi stream to a numpy array stream.

ng library. Waiting for cable

messy!

er….

ek.

lso Kernels.
s project.

on bounding boxes.
l it needs work. Got pedestrian code to work.
nt on vivint cameras.
or demo.

- 7/3 Success! Got 1080p stream to work on demo by merging code with vide-test.py . Co
- 7/5 Was able to add/delete and retrain the model. Read up about Kalman distributions
- 7/6 Found various tracking algorithms ("Boosting", "MedianFlow", "KCF" in open cv. Sor slooowww….May need some pointers
- 7/9 Took care of some intern stuff. Figured out how to add files to the model. Yolo9000
- 7/10 Got a rough scketch of algorithm to save names as faces turn. Working on implem
- 7/11 Got nice progress on the simple algorithim. Just need to work on having it continu
- 7/12 Almost there. Found a way to save some facial data frame-to-frame. Code not wor More debugging.
- 7/13 Lots of intern-related events happened. Continued debugging code.
- 7/16 SUCCESS! Facial detection will follow a face through dropped confidence and side
- 7/17 Researched Kalman/Particle filters and ways to implement them. May end up repl distance.
- 7/18 Started diving into Particle filters (a MC method for tracking). I want my code to w
- 7/19 Applying same logic from facial deteciton for person/body detection.
- 7/20 Continued work on person/body detection. Trying to identify face without facial ID
- 7/23 Able to get person tracking working with different ID numbers! Next, I'll try to get
- 7/24 Intern case competition presentation stuff + working on getting person bbox track
- 7/25 Made progress on improving clustering algorithim for close bboxes. Took care of in
- 7/26 (Mario Kart tournament) Started story on intern case competition and talked abou
- 7/27 Finished implementing improved tracking algorithm with existing code! Met w/gro
- 7/30 Code will now track facial IDs with highest confidence!
    - Research new projects/work. Presentation
- 7/31 Cleaned up code for facial/body tracking and pacticed presenting case competitio
- Audio: ~~Write a script to segment sentences.~~ Write a script to split audio into fix length s
    - Save 3-5 faces from video so we have nice labeled data.
    - Go through camera to find video/audio from yesterday
    - Try curling to send/receive files instead of TFTP
- 8/6 Finished work on wyze camera extracting. Intern case competition. Started writing s
- 8/7 Intern case competition! Finishing up audio splitter
    - Work on animations for voice/face recognition
    - Repo still not working. I want to put it on the demo
- 8/8 FMSC event. Finished audio splitter. Get repo syncing fixed and start animation idea
- 8/9 Starting work on basic animations. Finished face, working on voice animation.

- Fix facial detector so highest confidence name appears. Potentially have it save

onfigured video settings.
for possible bbox tracking.
me do better than others. Research is

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enting it…
e past the first frame.
rking as intended (confidence/ID not overriding).

views.
acing current tracking algorithm that only uses

ork for person detection (as well as face).

D. Hard part is managing IDs.
it working for names too.
ing compatible with names.
ntern case competition stuff.
ut barriers/concerns to the tech
oup for presentation

n presentation.
egments. Anything will do

script to split audio files.

as.

- Next: ~~Fix demo to have a higher resolution.~~
  - ~~How to add files to demo~~
  - What makes certain faces more accurate than others? (file size, lighting, beards, e
- Research bounding box tracking (2)
  - Research being able to match/track bboxes with people as they move.
  - Same logic will be applied to face s that are turned to the side. Model will be able
  - We can also identify other features like shirt color, glasses, etc. Through this mod
  - Mean shift algorithim, carbon filters?
  - Ask Chris H. about implementing particle filters

Problems:

What I am Stuck on

- I can't get Shewei's code to work by itself (or at least display the images)

Plan:

- Get Shiwei's code to work on my computer
- Draw_all_attention. Familiarize yourself with how the code works in bbox.py (5)
- How to improve accuracy of Facial detection model? Research other parameters (3)
- Demo Images: Figure out why: It's not printing "No Person". If you can adjust the freque
- https://docs.opencv.org/2.4/doc/tutorials/imgproc/imgtrans/filter_2d/filter_2d.html#c
- Talk to James (Virginia guy) about code on cloud and how it works.
  - They have the classifiers. You just need code for the points/boxes.
  - OpenCV 3 Multiple Object Tracking by Image Subtraction C++ full source code

  Get person detection working (being able to tell people apart) rtsp.py

Hold

  Problem cleaning supersensor data. Removing empty arrays
  Read in new super-sensor data (2)

Completed

ect)

to learn
el

ency of checkings. A key to exit conveniently.
onvolution.

Completed

- [x] Go through OpenCV library tutorials, install it on your machine, get it to work on your w communicate with the camera.
- [x] Install OpenCV
- [x] Pycharm is weird
- [x] Figure out how to do FFTs in scala (but it looks like it may need to be done in python)
- [x] Ask Shewei about trying to do it in python. Scala (Breeze) is hard.
- [x] Find out how to transform FFT results in scala
- [x] Learn how to interpret FFT results. (How can this identify trends?)
- [x] How does this fit into the scope of the problem at vivint?
- [x] Can the amplitudes be recovered?
- [x] Ask about filepath on the server

Be mindful of

- Identifying if A/C is on
  - How to work with this type of data
- Identifying potential mold spots
- Idenifying if a person is in the home

Random ToDos:

- [ ] Go through more Mlib Tutorials (esp. learn regression)
- [ ] MxTutorials

Goals

- Being uncomfortable is okay and normal. It means you're learning. Be okay with feeling tha
- Work on things that are directly benefiting your task or things that you are excited to learn
- When you feel like you're not going anywhere, ask for help

ebcam, and find binding boxes. Eventually get it to

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about