Pratical 3 part II: See what your camera sees

We now want to extract the raw images from your camera. We'll perform the following from your `scripts` folder.

```
$ cd ../scripts
```

- Plug in your camera. To download the photos:

```
$ python3 autographer.py --download True --destDir /Users/<yourName>/OxfordImageBrowser/images/me
```

- Then generate resized versions of your photos. You first need to install 'imagemagick' via Homebrew.

```
$ brew install imagemagick
```

If you don't have Homebrew, do:

```
/usr/bin/ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)"
```

Then to resize: (this will take about 10 minutes to run)

```
$ bash create_thumbnails.sh /Users/<yourName>/OxfordImageBrowser/images/me
```

- Now you can open `OxfordImageBrowser` and annotate your own data based on the instructions in `annotation.pdf`.

Annotating your own data

After annotating your own data using the scheme `annotation.csv`, please perform the following annotation exercises.

1. `social.csv`: annotate events which you think are of a social nature (e.g. having lunch with friends) versus those which are not.

2. `free_text.csv`: In the previous exercises, you have been confined by the definition of the labels to define 'events' / 'activities' within your day. In this case, could you come up with your own description or annotation labels and divide up your image timeline according to what feels most natural to you? You would need to put your event labels / descriptions into a csv file, and drag these to label your events. The current `free_text.csv` has been provided as an example but be creative.

3. Write a 1-liner summary for each day. Save this as a `per_day.csv` file where you have one line per row. Divide up your time line

At the end of these exercises, you should have 4 annotation csvs saved in your `OxfordImageBrowser/annotation/me` directory.

Copy the `me-annotation.csv` file over to your `wearables/data` folder.

Now unzip your `.csv.gz` file if you haven't done so already.

```
gunzip ../../data/myAcc-timeSeries.csv.gz
```

Finally, we want to check the model predictions against your true annotations.

```
$ cd ../../prac3
$ python check_annotations.py ../data/myAcc-timeSeries.csv ../data/me-annotation.csv --plotFile check_results.png
```

Inspect `plot.png` in your `data` folder and various `.png` generated in your `prac3` folder to see how the model has done!

Uncodeable Activities

In your resulting time-series file, you might notice that some of your annotations are 'uncodeable'. Here are some ways to fix this.

1. Sleep

Do the following if you want your annotated time series to have 'sleep' events.

Open your annotations file at `wearables/data/me-annotation.csv` and manually change the label of the events you believe correspond to your sleeping hours into `7030 sleeping`.

2. Other Events

Do the following if you notice that there are other events in your time series which you have annotated but appears to be 'uncodeable' in your plot.

Open the labels file at `prac3/label-dictionary.csv` and manually append the table.

For example, 'leisure;recreation;outdoor;15533 rock or mountain climbing' is not currently in the label dictionary. Append the table, putting 'leisure;recreation;outdoor;15533 rock or mountain climbing' in the 'annotation' column, and a category which you feel is appropriate under the 'NatComms-label-simplified' column (in this case I've assigned the latter as moderate):

	A	B	C	D	E	F	G	H	I
	occupation;agriculture;forestry;fishing;11543 shovelling digging ditches	3	11543	7.5	manual work	gym	tasks-moder	mixed	moderate
211	leisure;miscellaneous;walking;17070 descending stairs	2	17070	3.5	walking	walking	walking	walking	walking
212	home activity;miscellaneous;walking;5121 walking with moving and lifting loa	2	17133	4	walking	walking+acti	walking	walking	walking
213	transportation;walking;17250 walking as the single means to a destination no	2	21070	3	mixed-activit	walking	walking	mixed	walking
214	transportation;walking;17270 walking as the single means to work or class (n	1	17070	3.5	walking	walking	walking	walking	walking
215	transportation;public transportation;16016 riding in a bus or train	1	16016	1.3	vehicle	vehicle	vehicle	vehicle	sedentary
216	home activity;household chores;washing/ironing/mending clothes;5082 sewin	1	5082	2.8	household-ch	sitstand+low	tasks-light	mixed	tasks-light
217	leisure;sports;water activities;18012 boating power passenger	1	18012	1.3	vehicle	vehicle	vehicle	vehicle	sedentary
218	occupation;public admin/education/health;education;9071 teaching standing	1	9071	2.5	standing	sitstand+acti	tasks-light	sit.stand	tasks-light
219	leisure;recreation;outdoor;15533 rock or mountain climbing								moderate
220									
221									
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230									

Wiping images from your camera!

You should have loaded your images onto your computer by now so you can safely delete the data from you camera!

Plug your camera in, and go to `wearables/scripts/`:

```
$ python autographer.py --setup True
```

Notice that this command is the same one you ran in your very first practical to set up the camera: it does two things: 1. wipe data from device, 2. time-sync with your computer.

Handin: Return the camera and accelerometer to Hang by the end of the practical. She will take care of clearing your accelereometer data.

Visualizing your data

For this practical, we wish for you to produce some visualizations to share in a presentation. This practical is open-ended in nature, you can explore any topic as the basis of your visualization according to your interests.

Timeline

Prepare a timeline to illulstrate your days.

Taken from Nature news feature 'The lab that knows where your time really goes'

THE GADGET GUINEA PIG
DIARY OF A NATURE EDITOR

On 16 July 2015, I wore an accelerometer that tracks movement and a camera that took three images per minute. I also recorded what I was doing — and how much I was enjoying it — in a written diary. The Oxford Centre for Time Use Research in the United Kingdom is collecting gadget diaries in this way to find out if they produce more-useful information than do conventional paper diaries. **H.P.**
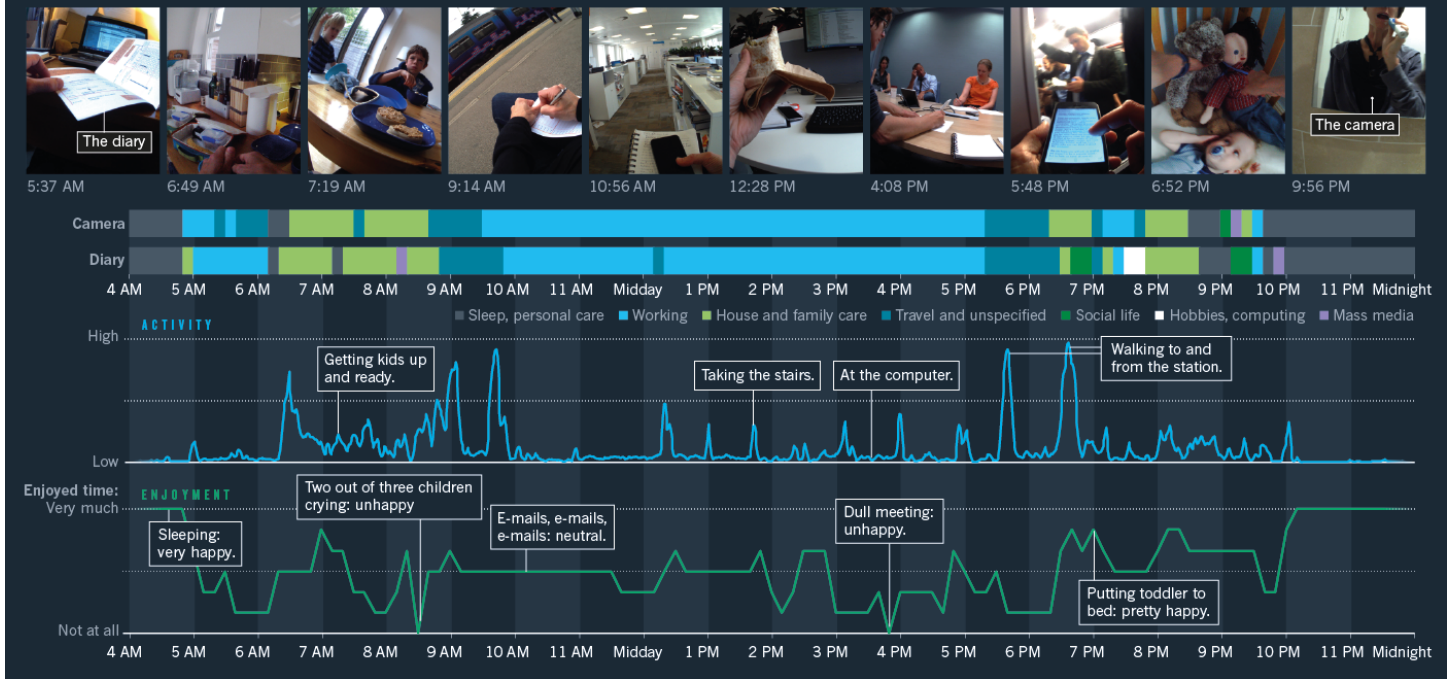
From 'Using wearable cameras to categorise type and context of accelerometer–identified episodes of physical activity', Doherty et al.
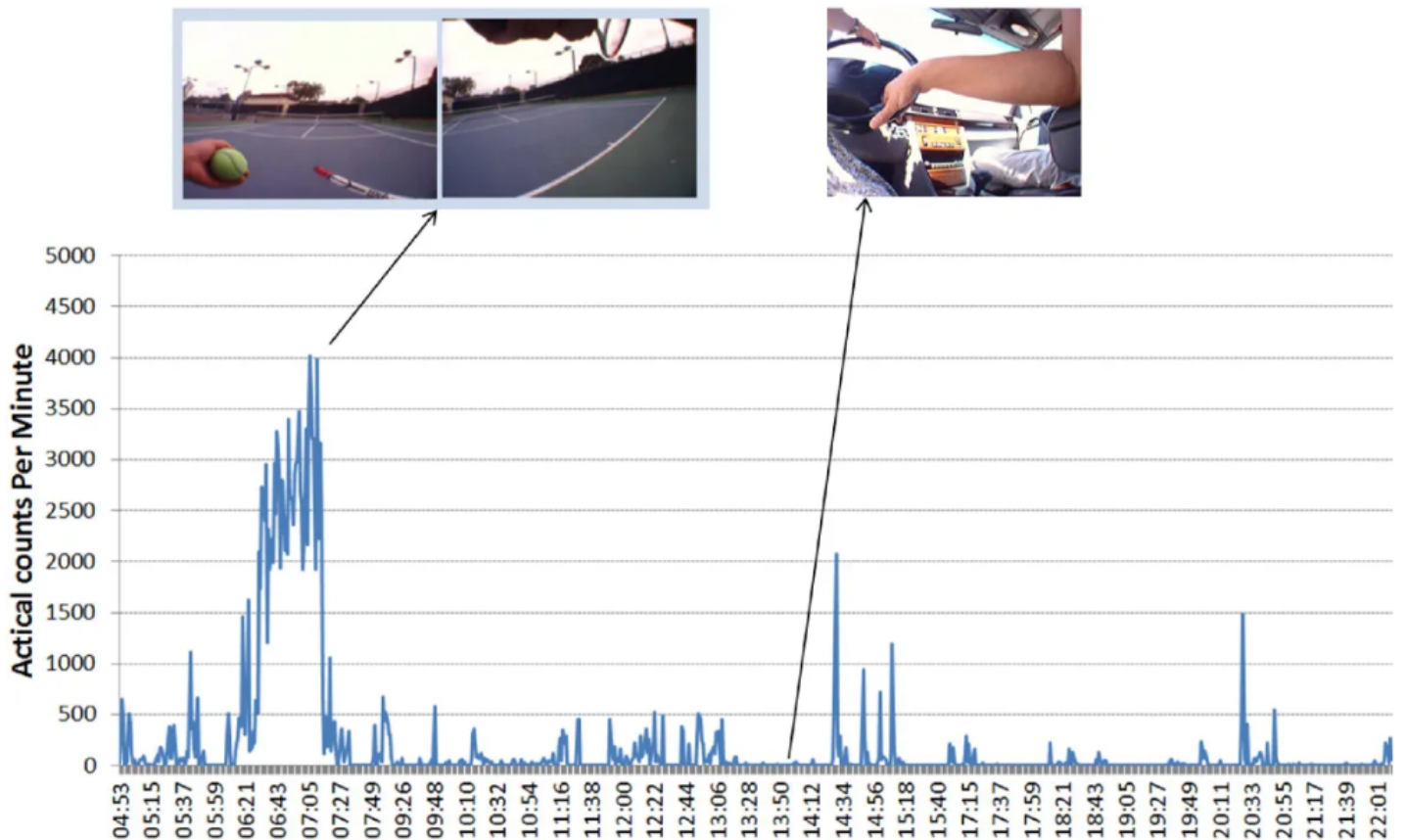
From 'Wearable camera-derived microenvironments in relation to personal exposure to PM2.5', Salmon et al.

A

B
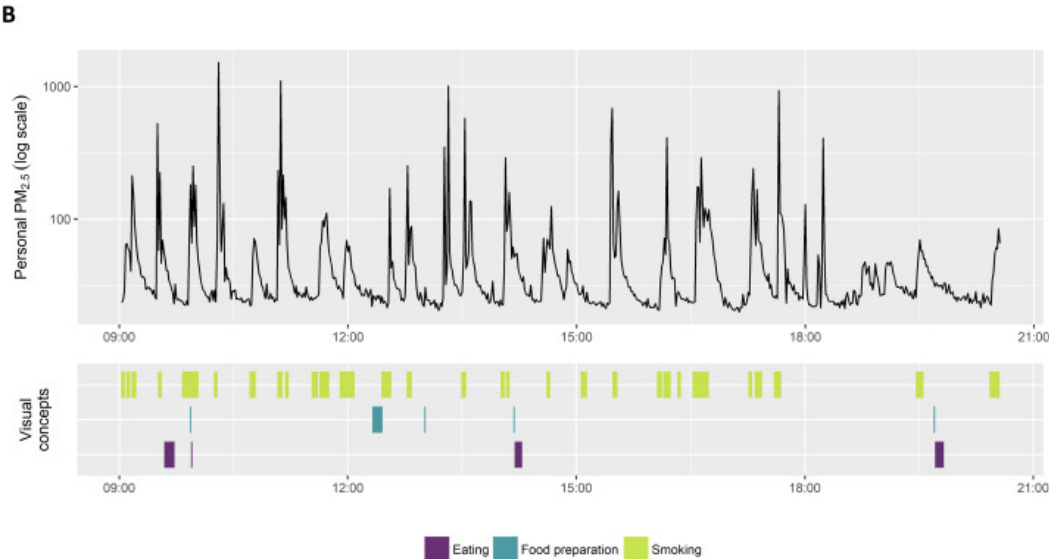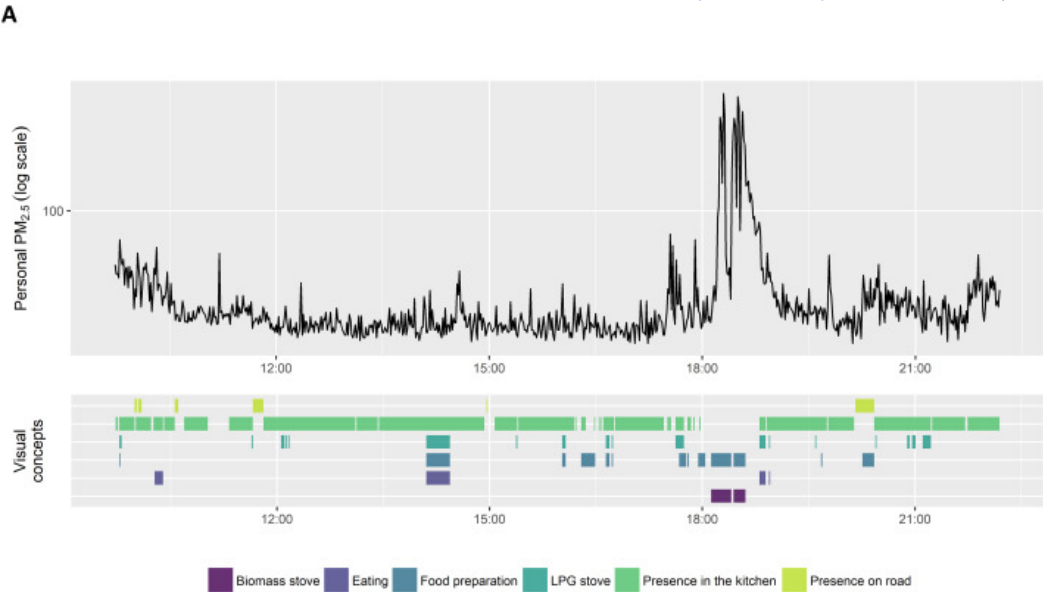
Side-by-side

Compare the data captured by the two devices (camera vs accelerometer) when you are performing different activities. Prepare a table of different activities, e.g. 'sitting', 'eating', 'walking' and show a side-by-side comparison of the two sources of data.

Here is a comparison of the activities 'typing on computer Vs. typing on phone' as captured by the two devices. 'Are Accelerometers for Activity Recognition a Dead-end?', Tong et al.
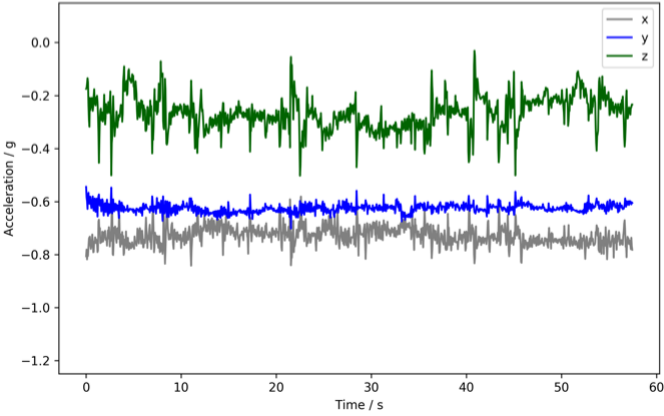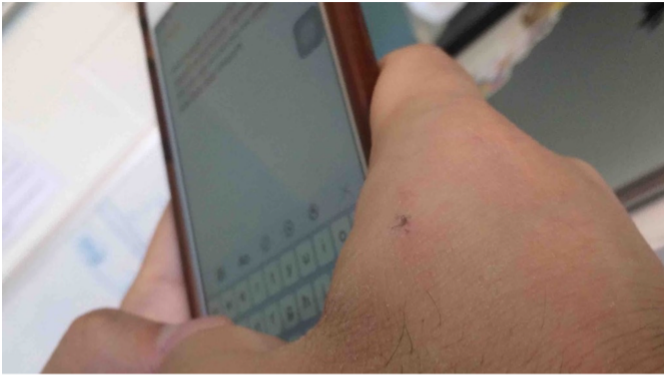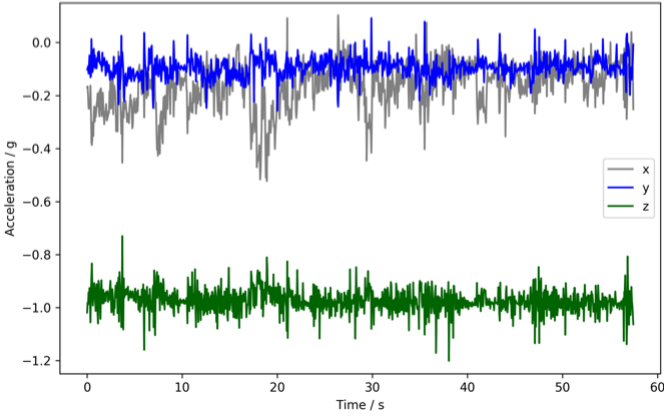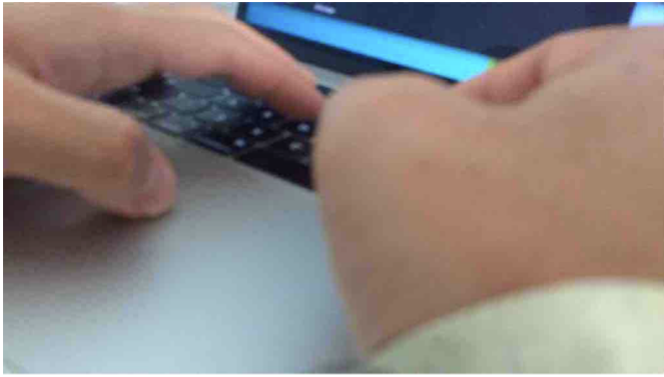
CDT-HDS Wearable Challenge
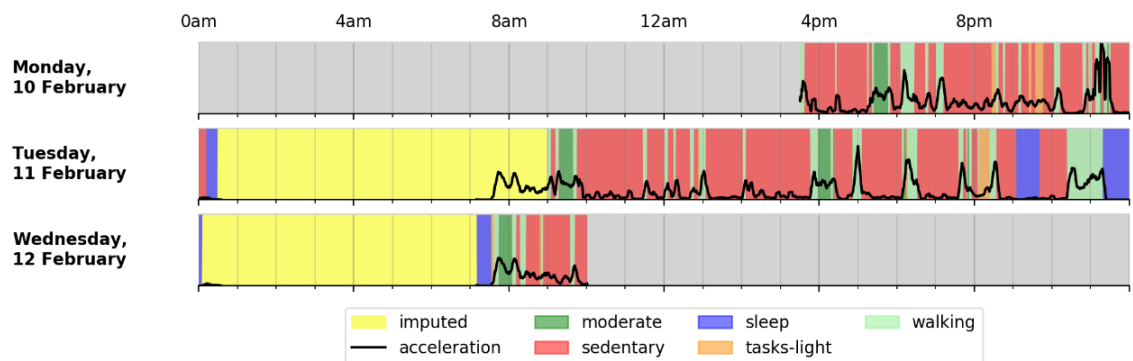
Total sessions

9

Total duration

133 min

Subject count

3

Ethnicity group

3

Two days in the life of an CDT student

	0am	4am	8am	12am	4pm	8pm

Monday, 10 February

Tuesday, 11 February

Wednesday, 12 February

- imputed
- acceleration
- moderate
- sedentary
- sleep
- tasks-light
- walking

Hang's Cycle Trace

Acceleration

Time (s)

— x_mean — y_mean — z_mean — norm
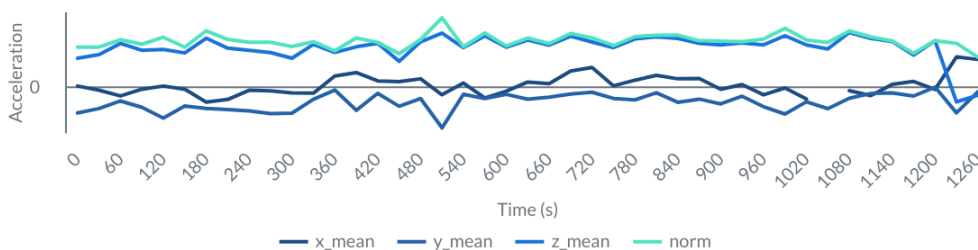
T1: Double click to edit

Maxime's Cycle Trace

Acceleration

Time (s)

— x_mean — y_mean — z_mean — norm

Franck's Cycle Trace

Acceleration

Time (s)

— x_mean — y_mean — z_mean — norm
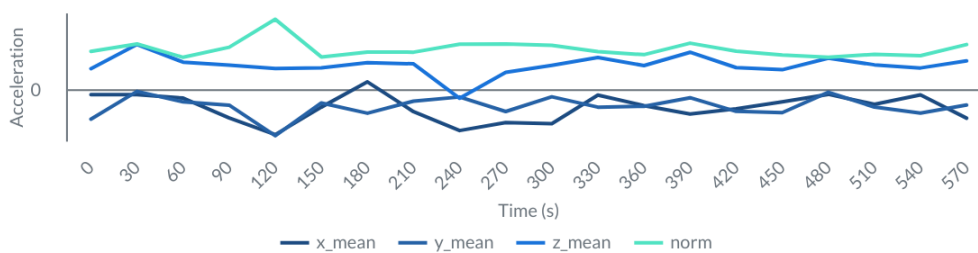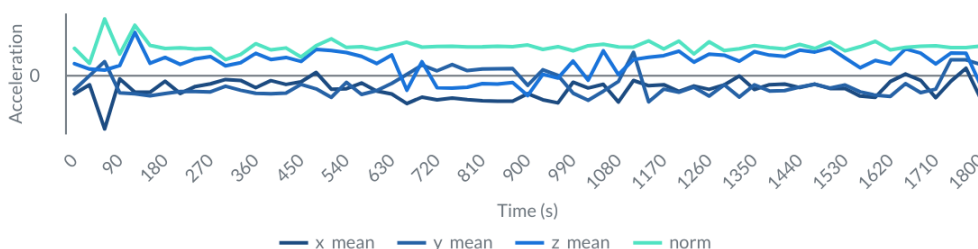
Findings

- Gym/home workout are misclassified

- Directions of axises could switch frequently

- Axises likely to switch at the end of a bike journey

- Some exercies might be easier to classify than the others

Propose your own task

The above is an example from last year.

If none of the above visualizations inspire you, feel free to propose and pursue your own idea.

Some ideas might be:

- Compare the different annotation schema you had used

- Look into the distribution of activities in your data