

## **Gesture Recording , 8.4.14, Lorenz Gruber, Final Year Project**

### **Gesture to be Recorded:**

- 01 – double knock
- 02 – tick move
- 03 – ind move + 90 deg turn right
- 04 – right left right left
- 05 – z move

### **Test Persons**

8 Persons, between 22 and 24, 6 male, 2 female. A list with the details is in the appendix.  
All testers were standing during the recording.  
Only right hands were used.

### **Total samples**

Each tester recorded 10 repetitions for each of the 5 gestures.  
 $8 \text{ Persons} * 5 \text{ Gestures} * 10 \text{ Repetitions} = 400 \text{ Samples}$

### **Position of phone:**

The phone is held in the users right hand. It is held with screen faces up. Homebutton towards user.  
An I-Phone 4 with iOS 6.1.3 was used to record. The recording was done using a web application running in the Safari browser.

### **Start position of hand:**

The hand should be in a calm position with right hand straight, as if one was cycling.

### **Start and stop sound:**

The phone makes a start and stop sound to indicate to the user when to start...

### **Recording details:**

Recording period: 2s  
Pause: 2s  
FSample: 60 Hz  
Repetitions per Gesture: 10  
The gestures were recorded in the same order. 1 through to 5.

The acell data from the I – Phone is at maximum +/- 2g. Not sure why that is.

### **Recording Procedure:**

The person conducting the test (me), explained the aim of the recording to the tester. Then a piece of paper (Scan is in the Appendix) with names and movements was shown to the tester. Then I performed each gesture to the tester to show them what it looks like.  
The tester was also told how to hold the phone in his hand.  
Then I started a trial recording to show how the start and stop sounds worked.  
They were told to go back to the original position after the stop sound. However I did not stress the initial position to all testers in the same manner. I told most of them to hold the right arm straight down (as if the were cycling).

For gesture 2 and 3, the tester was told to stay in the final position until the stop sound occurs.

Extra care had to be taken to select the correct gesture and name in the web application before sending the data to the server.

### File name structure in csvData:

Each .csv file is named as g[XX]\_[YY]\_t[ZZ].mat:

[XX]: gesture index

[YY]: tester ID

[ZZ]: trial index

**IMPORTANT!! the acceleration values are in g, not m/s<sup>2</sup>.**

Each .csv file has 8 columns (the gyro data was recorded as well. )

t epoch time in ms

tRel relative time in s

x in g

y in g

z in g

alpha

beta

gamma

### Json structure in jsonData

IMPORANT: the acceleration data is the raw data from the phone. It needs to be divided by 10 for the correct acceleration in Gs. For the CSV files this has been done.

**UPDATE 5.6.14, this json structure was changed to allow more general inputs**

The json files contains all recordings from one person:

Top level: Array / List containing individual gesture Objects / Dict

[ g0, g1, g2, g3, g4, g5] → might not be in order

gx: Object/Dict containing info about recording

```
{
  origSampleFrequ: 60,
  startTime: 1396897906944,
  repetitions: Array[10],
  gesture: "1",
  user: "XX",
  periodGesture: 2000, // in ms
  noOfRepetition: 10
}
```

repetitions: Array/ List containing containing individual repetition Objects / Dict

[ r0, r1, r2, r3, r4, r5, r6, r7, r8, r9] → might not be in order

rx: Object/ Dict containing raw data.

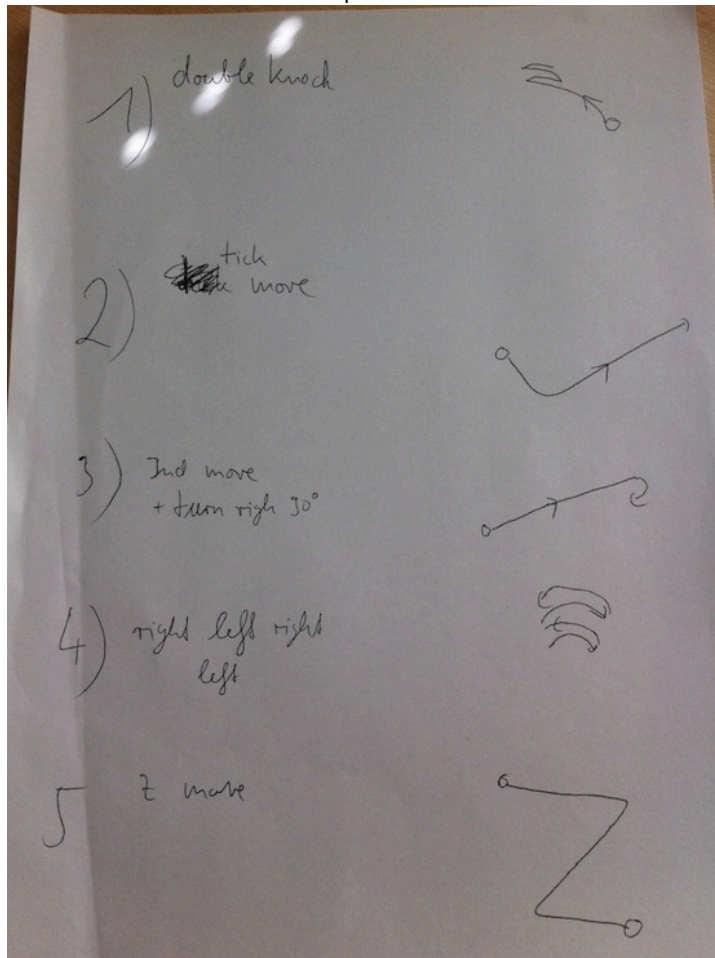
```
{
  alpha: Array[121]
  beta: Array[121]
  gamma: Array[121]
  rep: 0
  t: Array[121]
  x: Array[121]
  y: Array[121]
  z: Array[121]
}
```

## Appendix:

All recording were done on the 8.4.14.

ID	Name	Age	Notes
L2	Loek	22	"2s for G4 was too little"
V1	Vicky	22	- got out of Rhythm for G1 once - abrupt movements for G4 - carefule, G2 – G5 was recorded with wrong name (but that was fixed afterwards)
R1	Richard	23	- suggested to bring a bike to the labs and do it with a bike - suggested to do a survey which gestures users like
T1	Thomas	22	
O1	Oskar	23	Knocked on the phone directly for G1
J2	Josh	23	
N1	Nina	24	- check for g04 whether she got out of rhythm - held the phone slightly more horizontal than others.

Picture that was shown to test persons:



Position in which phone was held:

Ok, this is a mouse, but imagine the sticker that you see at the back of the mouse to be the screen of the phone.



Picture from server for the noise data. However it was recorded on localhost only.  
The second to last row is g11 and the top row is g19.

Accel data

0.0.0.0:8080/listData

Apps

W Lo

Maps

YT

Z

FC

LEO

RB

IMP

FYP

Recipes

Chall

Videos

Other Bookmarks

Collect!

Show

## Data samples taken

The "Av. sampling frequ" might be higher than the "Orig. sampling frequ". Reason for that is that the sample period is 2ms less than the value entered. Through tests, it was found out that those 2ms make the measurements more accurate.

Start time	User	Duration	# of samples	Av. F_s	Orig. F_s	Data Gap		Entity key
2014-04-22 15:02:01.884000	all g no case	18.0	1126	62.40	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	5064350557536256
2014-04-22 15:01:10.185000	all g cse	21.4	1342	62.58	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	5345825534246912
2014-04-22 14:59:11.932000	w m c 90twice phone in caset short	24.3	1526	62.84	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	4782875580825600
2014-04-22 14:57:52.082000	w m c tick twice phone in caset short	15.1	954	63.25	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	5486563022602240
2014-04-22 14:56:14.606000	w m c tick twice phone in caset	37.7	2369	62.89	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	4923613069180928
2014-04-22 14:53:48.758000	w m c no ind race phone in case	30.0	1865	62.17	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	5205088045891584
2014-04-22 14:52:12.152000	w m c no ind phone in case	37.8	2376	62.85	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	4642138092470272
2014-04-22 14:48:23.461000	stand up walk to liv room and back phone in case	26.8	1693	63.10	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	5556931766779904
2014-04-22 14:43:58.634000	stand up walk to liv room and back phone in hand	25.6	1619	63.37	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	4993981813358592
2014-04-22 14:37:26.066000	lo test	3.7	227	60.99	60.0	0	<a href="#">json</a> <a href="#">csv</a> <a href="#">plot</a>	5275456790069248

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