Deliverable 4.2
Validation Tests

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4 Introduction and Study Design

This document summarizes TraiNutri service usage (quantitative) result from the pilot study. First part (Sections 5 and 6) presents the physical activity results from all participants of the pilot and an "typical day" for one selected user. Section 7 presents results for activity recognition service, Section 8 – for nutrition service and Section 9 – social network service.

4.1 Study Participants

To recruit the participants, in each country we have advertised the study via an informal "word of mouth" method. We aimed to get at least 2 participants per a country: Greece, Switzerland and Spain and in total we have had 10 participants. We have got a profile of the participant and his/her view on technology (as reported in D4.1). Table 1 summarizes participants' characteristic as most important for the quantitative data analysis conducted in this deliverable; (from left): Participant ID(s) (country code and ID stored in the database of TraiNutri), gender, age, profession, phone type, if phone was owned by the participant or borrowed, and the total number of days of participation in the study.

Table 1 TraiNutri Study Participants

Subject ID	Gender	Age	Profession	Phone Type	Own Phone?	Total Days Participated
GR-196				Galaxy SII	no	14
GR-197				Galaxy SII	no	15
ES-340						9
ES-341						9
ES-187	Male	26	Researcher	Galaxy SII	yes	9
ES-423	Male	30	Researcher	Galaxy SII	yes	10
CH-250	Male	63	Retired	Galaxy Nexus	no	20
CH-251	Female	63	Retired	Galaxy Nexus	no	19
CH-205	Male	47	CEO	Galaxy Nexus	no	33
CH-297	Female	40	N/A	Galaxy Nexus	no	10

4.2 Applications Running

On the participant's mobile phones, there were running:

- ALE application that unobtrusively collects the information on physical activity levels
- Activity recognition application that unobtrusively collects the information on physical activity types

- Nutrition application that enables the user to insert the information about meal
- Social network service that allows user to access his/her social network of TraiNutri

There were no particular requirements for participants using TraiNutri, besides to carry the phone in their pocket, to acquire accurate results for ALE. The TraiNutri application logs were immediately written to the phone storage card to minimize the memory allocation on the phone throughout the data collection process, as well as to minimize the risk of data loss. On regular basis the logs were synchronized with the social network server.

Table 2 presents the results for participants given the number of effective days for a given application. An effective day we mean is a day when the given application module was running in the study, i.e., either running automatically (ALE) or being interacted with by the user.

Table 2 TraiNutri Applications: Pilot Study Statistics

Subject ID	Total Days Participated	Effective Days			
		ALE	Activity Recognition	Nutrition Application	Social Network
196	14	7	2		
197	15	10	9		
340	9	5	2		
341	9	6	4		
187	9	3	1		
423	10	2	2		
250	20	20	2		
251	19	19	6		
205	33	25	8		
297	10	5	2		

5 Physical Activity Level (ALE) Results

The following table (Table 3) represents a complete ALE result for all users in the pilot study. For each user, we computed the time total per levels and the effective days.

Table 3 ALE numerical results for all participants

Greece

User ID	196	User ID	197
Effective days	7/14	Effective days	10/15
Total Low	01:42:25	Total Low	00:42:14
Total Moderate	00:15:48	Total Moderate	02:35:52

	Total Vigorous	00:00:04	Total Vigorous	00:00:35
	Average Low	00:14:38	Average Low	00:04:13
	Average Moderate	00:02:15	Average Moderate	00:15:35
	Average Vigorous	00:00:01	Average Vigorous	00:00:03

Spain

	User ID	340	User ID	341
	Effective days	5/9	Effective days	6/9
	Total Low	02:39:11	Total Low	02:02:48
	Total Moderate	01:32:48	Total Moderate	01:28:43
	Total Vigorous	00:27:30	Total Vigorous	00:12:26
	Average Low	00:31:50	Average Low	00:20:28
	Average Moderate	00:18:34	Average Moderate	00:14:47
	Average Vigorous	00:05:30	Average Vigorous	00:02:04

	User ID	187	User ID	423
	Effective days	3/10	Effective days	2/10
	Total Low	00:00:31	Total Low	00:30:17
	Total Moderate	00:00:02	Total Moderate	00:26:30
	Total Vigorous	00:00:00	Total Vigorous	00:00:00
	Average Low	00:00:10	Average Low	00:15:09
	Average Moderate	00:00:01	Average Moderate	00:13:15
	Average Vigorous	00:00:00	Average Vigorous	00:00:00

Switzerland

	User ID	250	User ID	251
	Effective days	20/20	Effective days	19/19
	Total Low	06:43:07	Total Low	11:38:03
	Total Moderate	00:49:40	Total Moderate	00:35:57
	Total Vigorous	00:00:00	Total Vigorous	00:00:06
	Average Low	00:20:09	Average Low	00:36:44
	Average Moderate	00:02:29	Average Moderate	00:01:54
	Average Vigorous	00:00:00	Average Vigorous	00:00:00

	User ID	205	User ID	297
	Effective days	33	Effective days	5/10
	Total Low	16:40:25	Total Low	02:01:32
	Total Moderate	07:02:18	Total Moderate	03:26:49
	Total Vigorous	00:21:28	Total Vigorous	00:04:33
	Average Low	00:40:01	Average Low	00:24:18
	Average Moderate	00:16:54	Average Moderate	00:41:22
	Average Vigorous	00:00:52	Average Vigorous	00:00:55

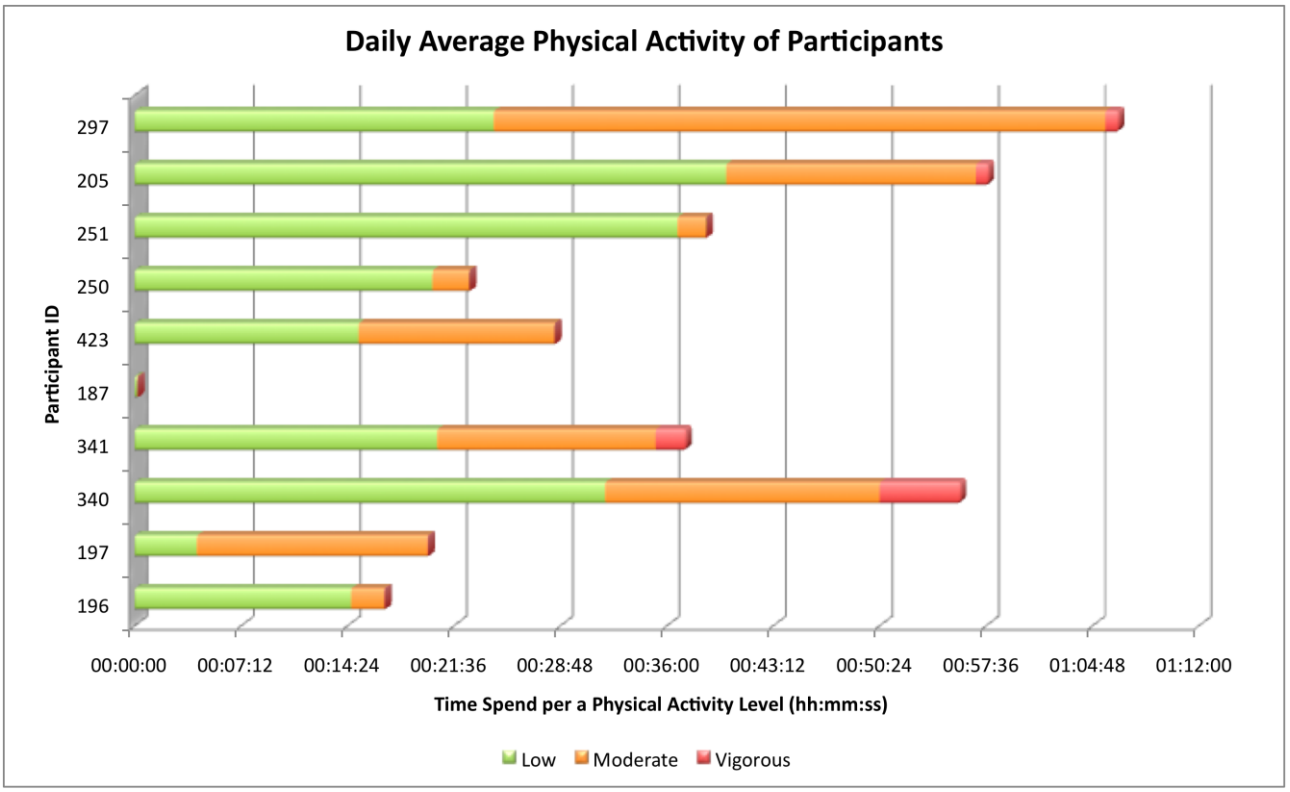

Figure 1 ALE daily average results for all participants

For ES-187 we have not collected any data, it can be due to malfunctioning phone. Based on the results we conclude that our sample size was too small to provide definite feedback on the application, however we can see in the Table 3 that only 4 participants (197; 205; 297; 340) met the WHO recommendation for a physical activity. There is a room for a TraiNutri-like intervention. For reminder, the WHO recommends to perform minimum 150 minutes of moderate activity or 75 minutes of vigorous activity. Both levels can be combined with the ratio:

$$minute[moderate] = 2x\ minutes[vigorous]$$

6 Results Sample from One User

Following graphs represent results per day from the user 205 during one representative week. On X axis we present the hours of the day, while on Y axis we present the minutes spend on given activity levels.

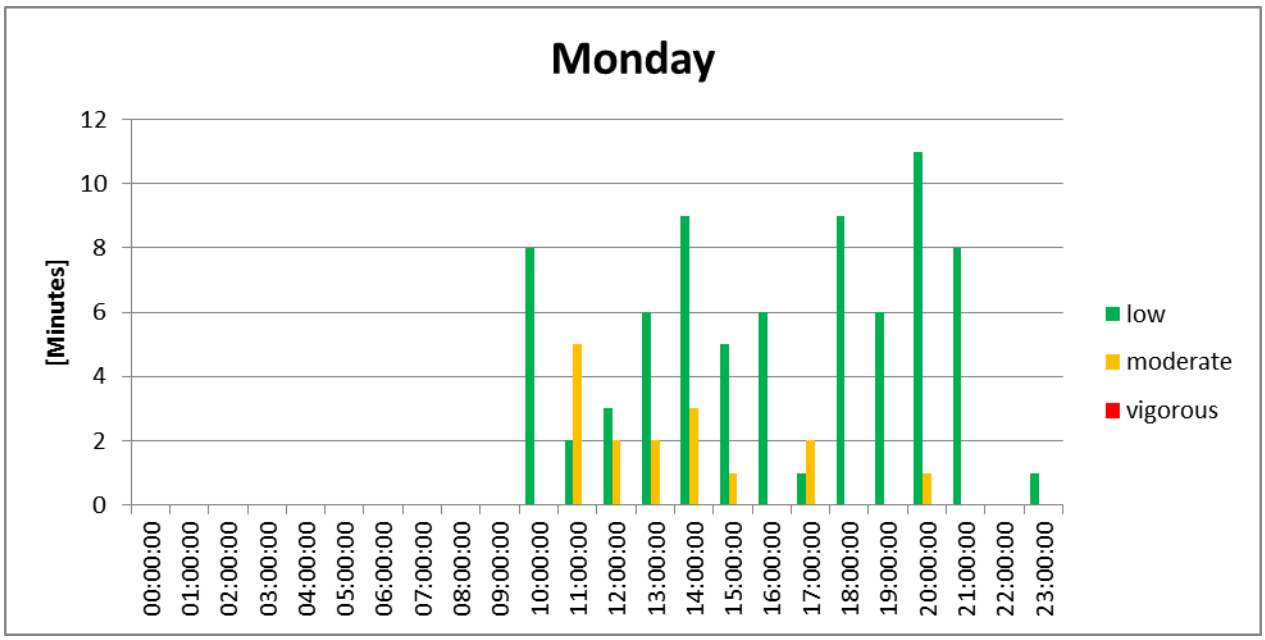

Figure 2: User 205: Monday results

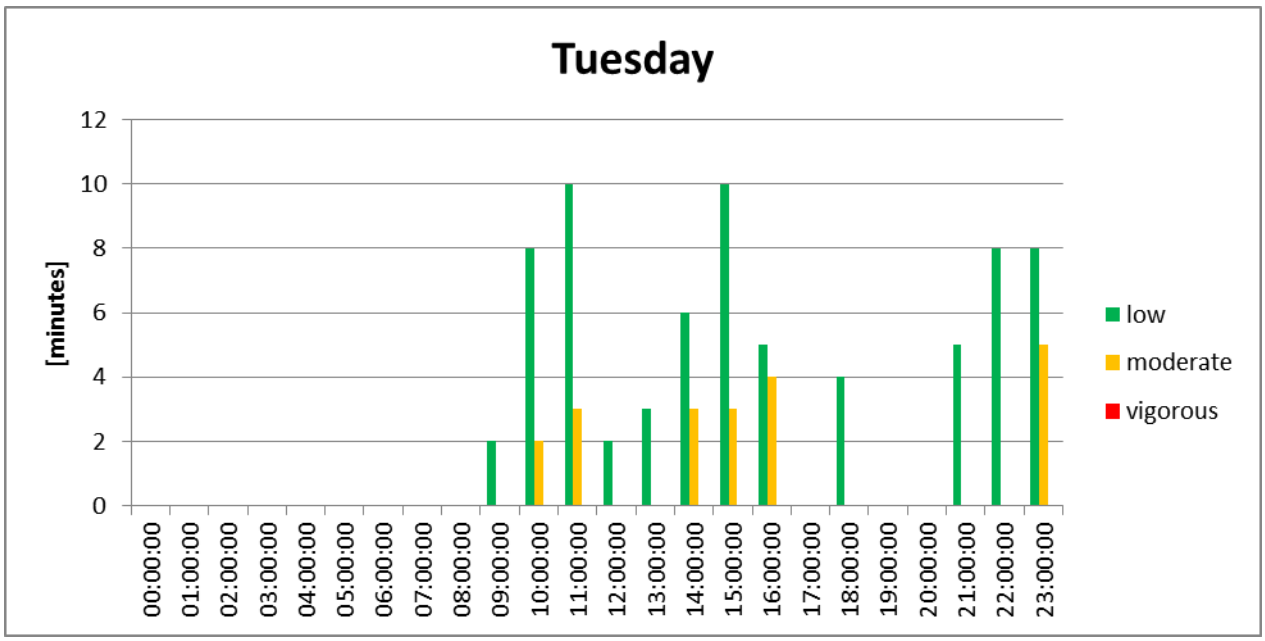

Figure 3: User 205: Tuesday results

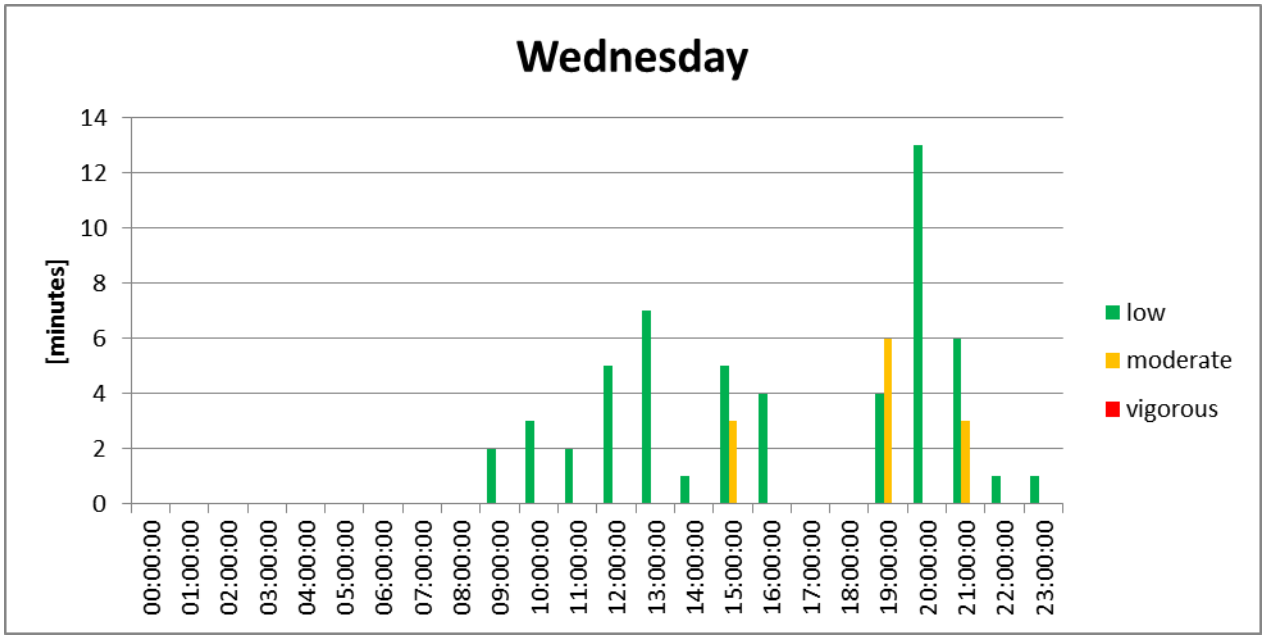

Figure 4: User 205: Wednesday results

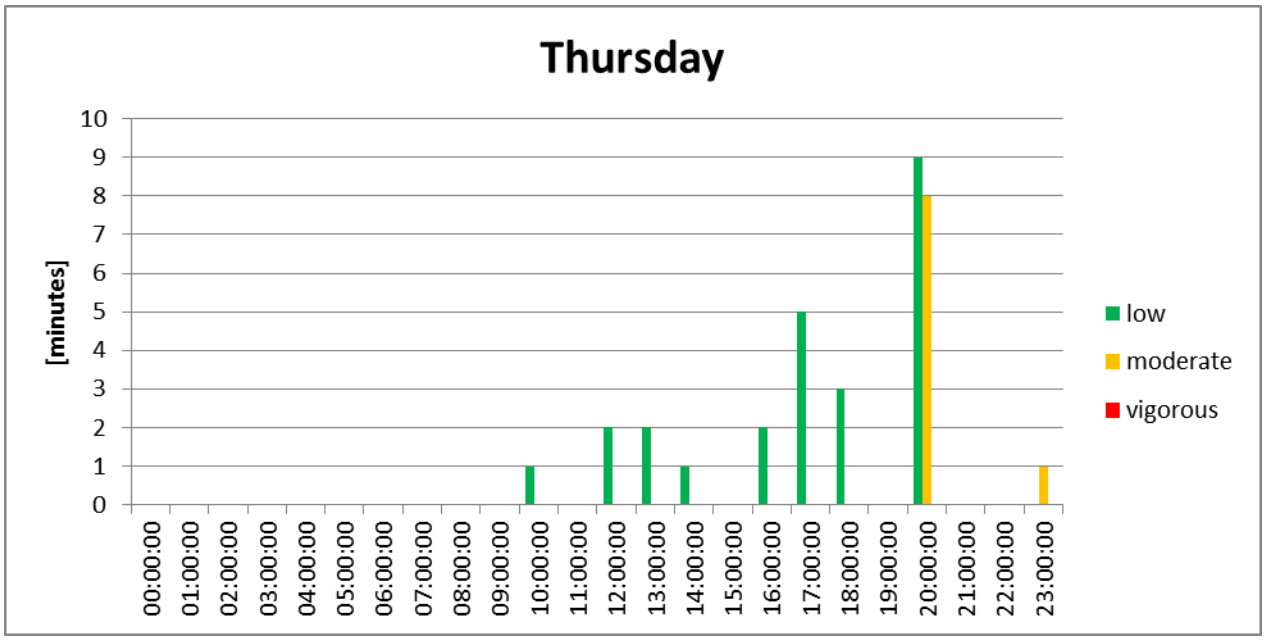

Figure 5: User 205: Thursday results

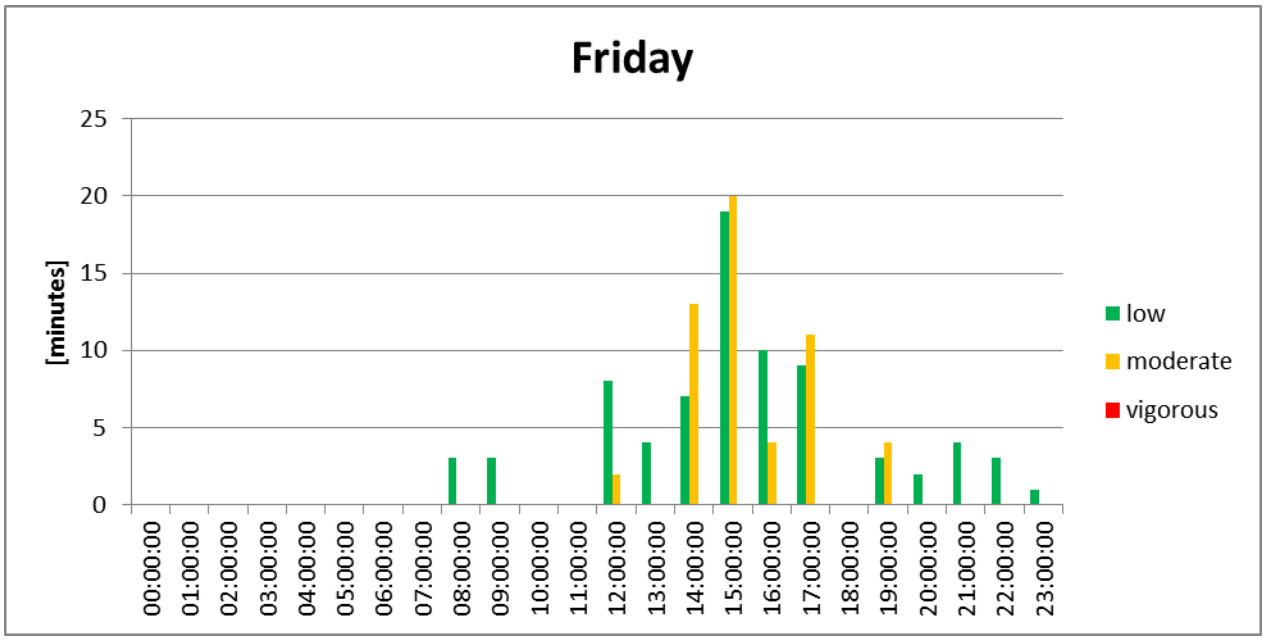

Figure 6: User 205: Friday results

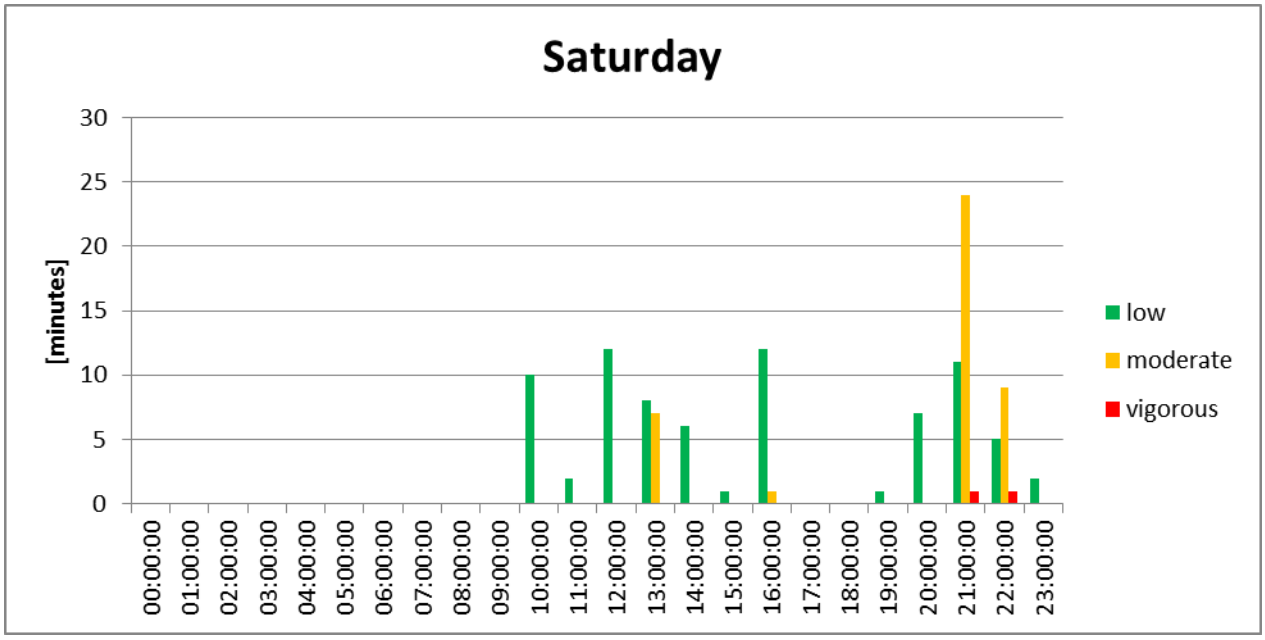

Figure 7: User 205: Saturday results

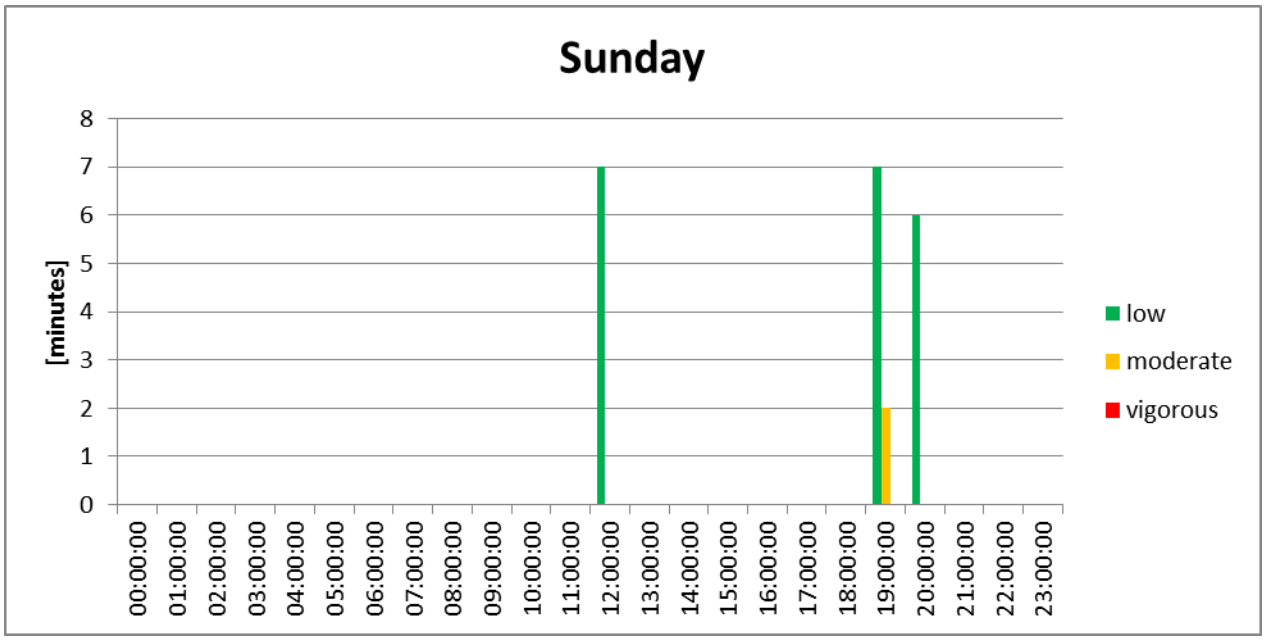

Figure 8: User 205: Sunday results

The next graph represent in total the physical activity of the user during one week.

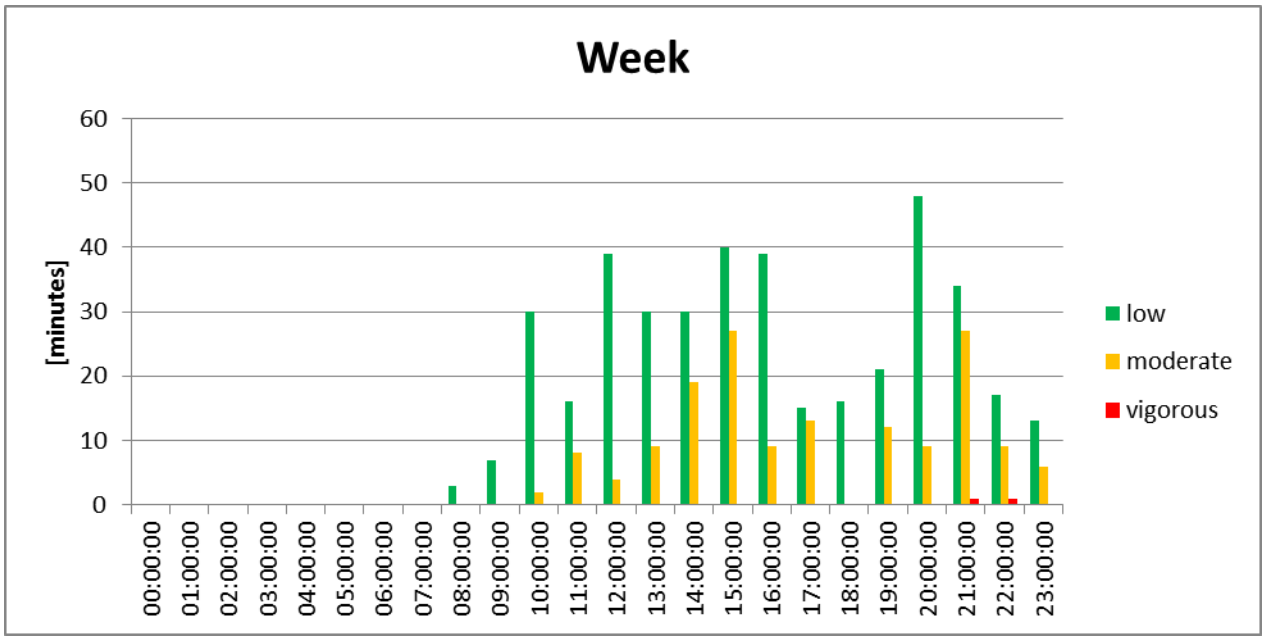

Figure 9: User 205: Week results

This user reach the WHO recommendations with 154 minutes performed at a moderate level during the week.

7 Physical Activity Recognition Results

7.1 General Results

The following table (Table 3) represents a complete Activity Recognition Service result for all users in the pilot study. For each user, we computed the total time per activity and the effective days.

Table 4: Activity Recognition numerical results for all participants

Greece				
	User ID	196	User ID	197
	Effective days	2/14	Effective days	9/15
	Time Sitting	09:53:23	Time Sitting	23:07:52
	Time Standing	00:01:13	Time Standing	00:00:52
	Time Walking	00:51:03	Time Walking	11:38:42
	Time Running	00:00:00	Time Running	00:03:07
	Time Ascending Stairs	00:02:16	Time Ascending Stairs	00:43:58
	Time Descending Stairs	00:02:03	Time Descending Stairs	03:49:53

Spain

User ID	340	User ID	341
Effective days	2/9	Effective days	4/9
Time Sitting	08:07:24	Time Sitting	11:40:28
Time Standing	00:01:28	Time Standing	00:25:36
Time Walking	00:34:46	Time Walking	01:07:01
Time Running	00:07:22	Time Running	00:07:22
Time Ascending Stairs	00:12:17	Time Ascending Stairs	00:19:05
Time Descending Stairs	00:02:32	Time Descending Stairs	04:55:09

User ID	187	User ID	423
Effective days	1/10	Effective days	2/10
Time Sitting	00:00:15	Time Sitting	03:11:01
Time Standing	00:00:00	Time Standing	00:05:34
Time Walking	00:02:25	Time Walking	00:59:28
Time Running	00:00:00	Time Running	00:04:10
Time Ascending Stairs	00:00:17	Time Ascending Stairs	00:08:33
Time Descending Stairs	00:00:00	Time Descending Stairs	01:06:50

Switzerland

User ID	250	User ID	251
Effective days	2/20	Effective days	6/19
Time Sitting	16:02:10	Time Sitting	32:51:41
Time Standing	00:01:01	Time Standing	00:18:55
Time Walking	05:24:02	Time Walking	06:37:29
Time Running	00:04:12	Time Running	00:03:58
Time Ascending Stairs	00:09:35	Time Ascending Stairs	00:15:49
Time Descending Stairs	00:47:03	Time Descending Stairs	08:55:30

User ID	205	User ID	297
Effective days	8/33	Effective days	2/10
Time Sitting	02:25:10	Time Sitting	00:57:12
Time Standing	00:02:05	Time Standing	00:01:57
Time Walking	04:57:23	Time Walking	00:16:39
Time Running	00:06:18	Time Running	00:00:41
Time Ascending Stairs	00:19:04	Time Ascending Stairs	00:04:53
Time Descending Stairs	12:34:57	Time Descending Stairs	01:47:12

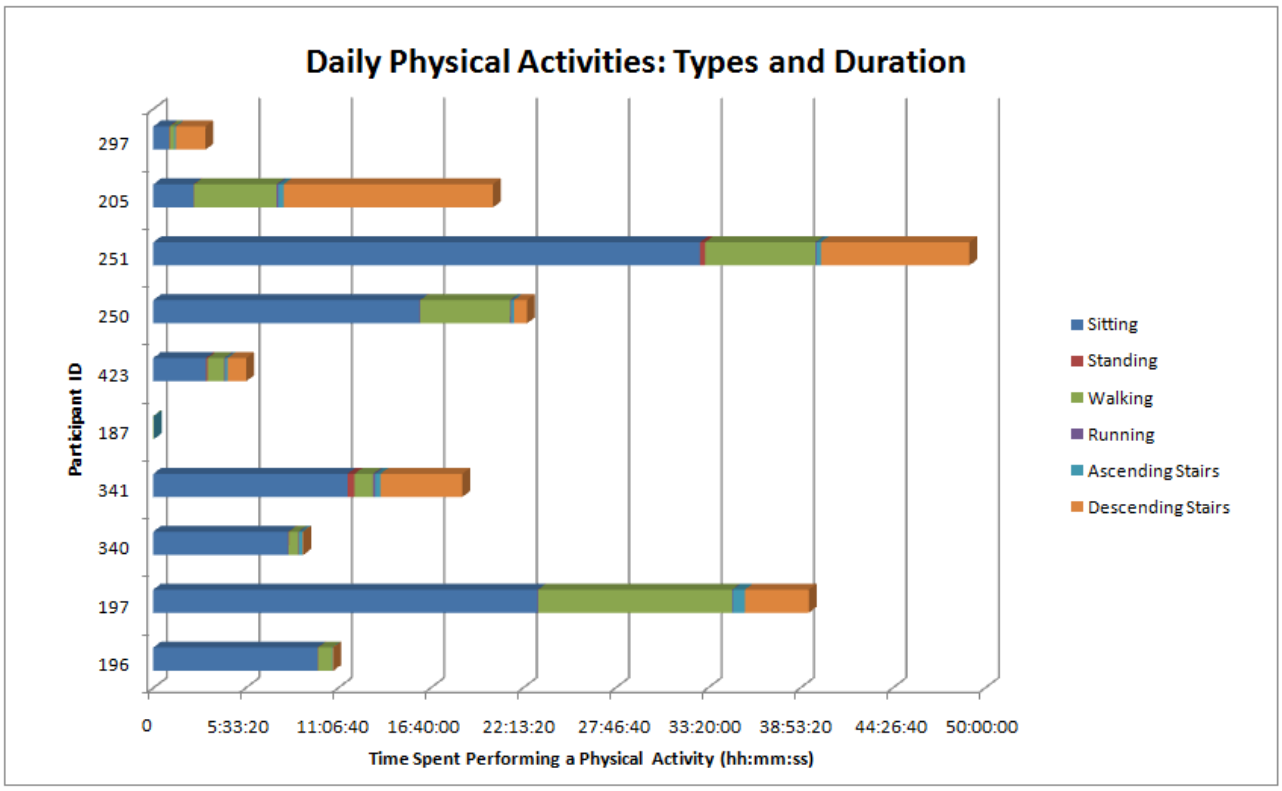

Figure 10: Activity Recognition graphical results for all participants

7.2 Results Sample from One User

Following graphs represent results per day from the user 197 during one representative week. Since on Monday and on Tuesday, the user did not use the activity recognition module, there are no samples for these two days, so we present a total of five graphs. On X axis all the possible activities are presented, while on Y axis we present the amount of time spent performing each type of activity.

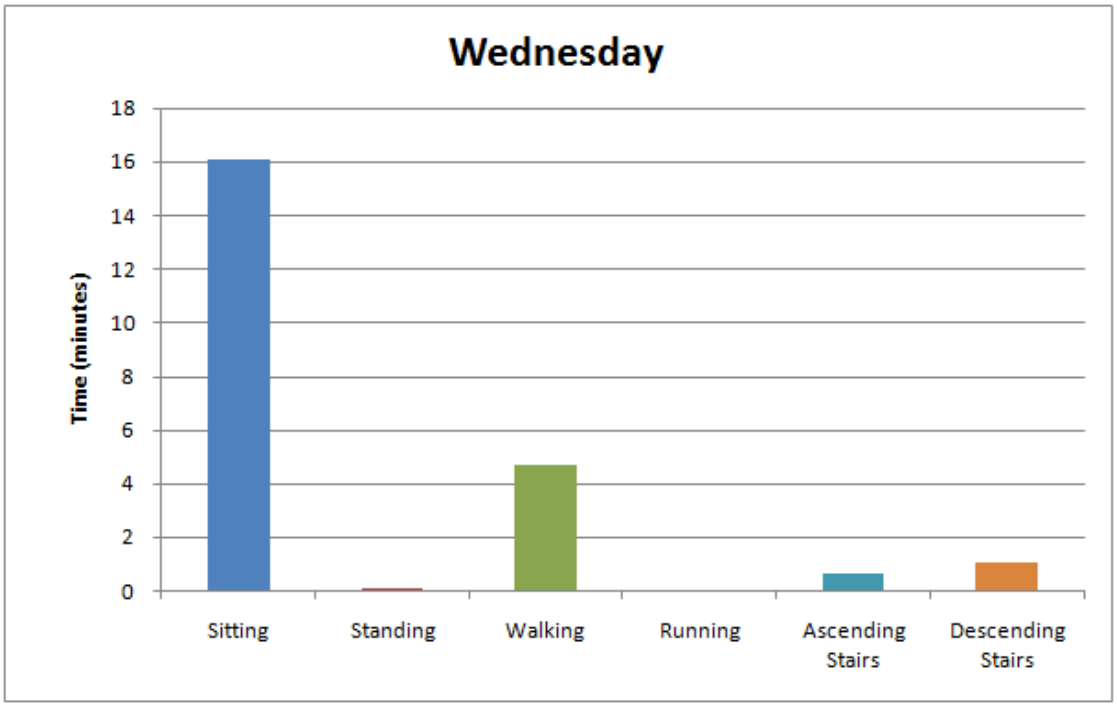

Figure 11: User 197: Wednesday Results

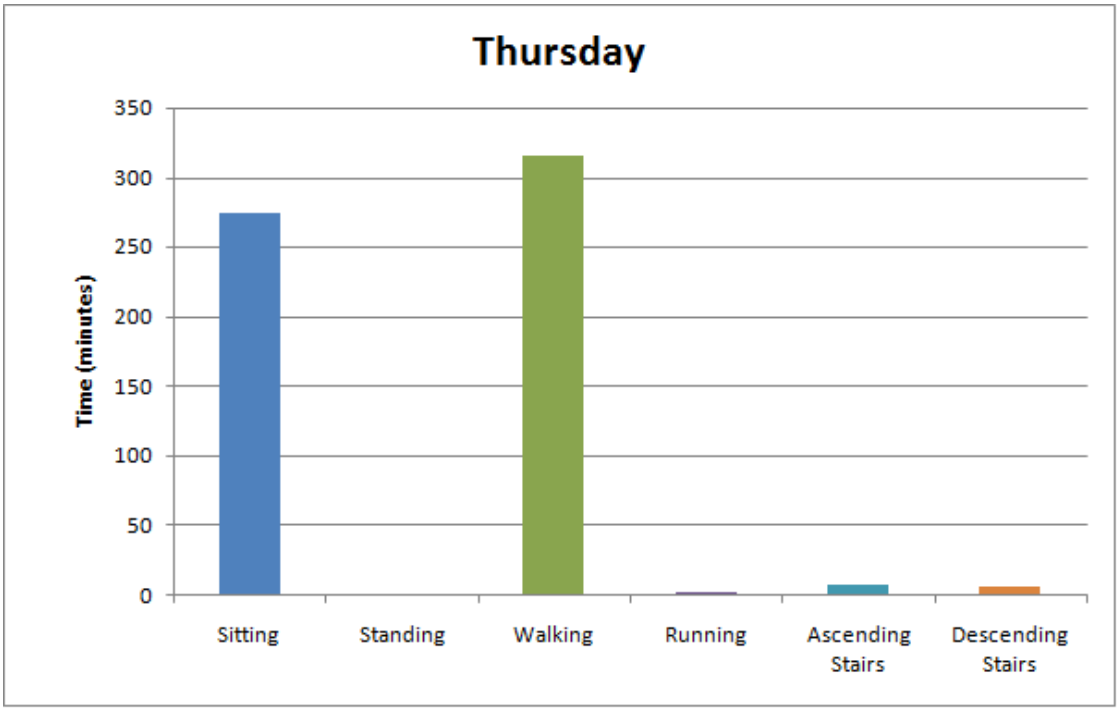

Figure 12: User 197: Thursday Results

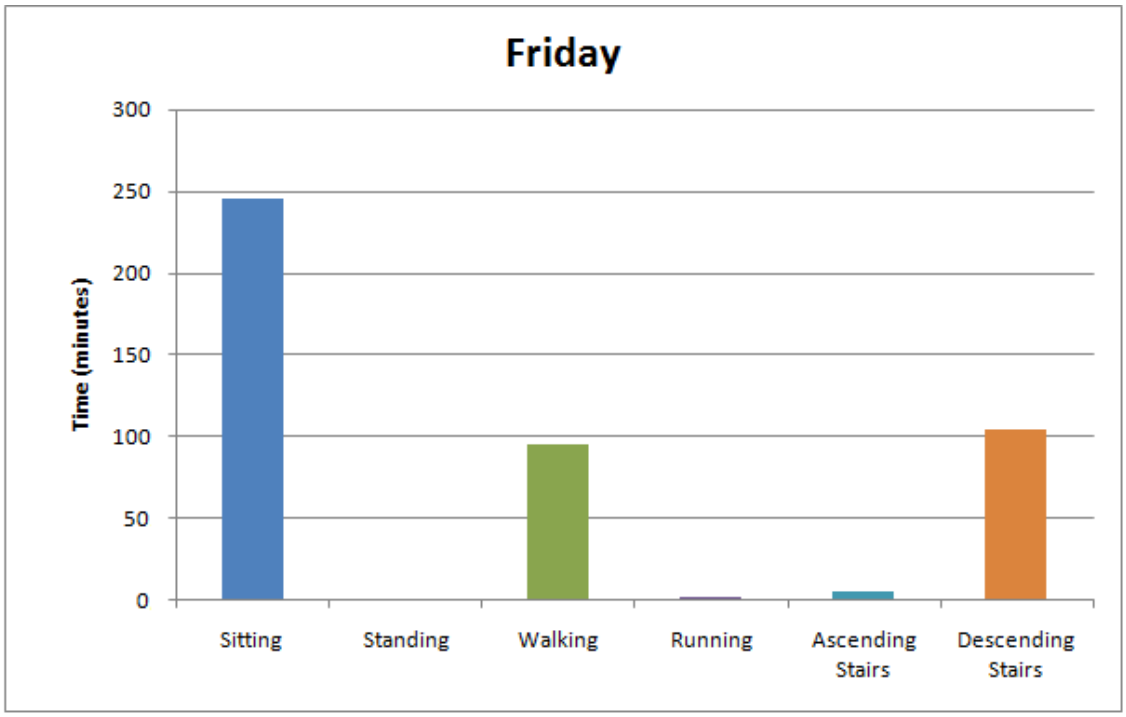

Figure 13: User 197: Friday Results

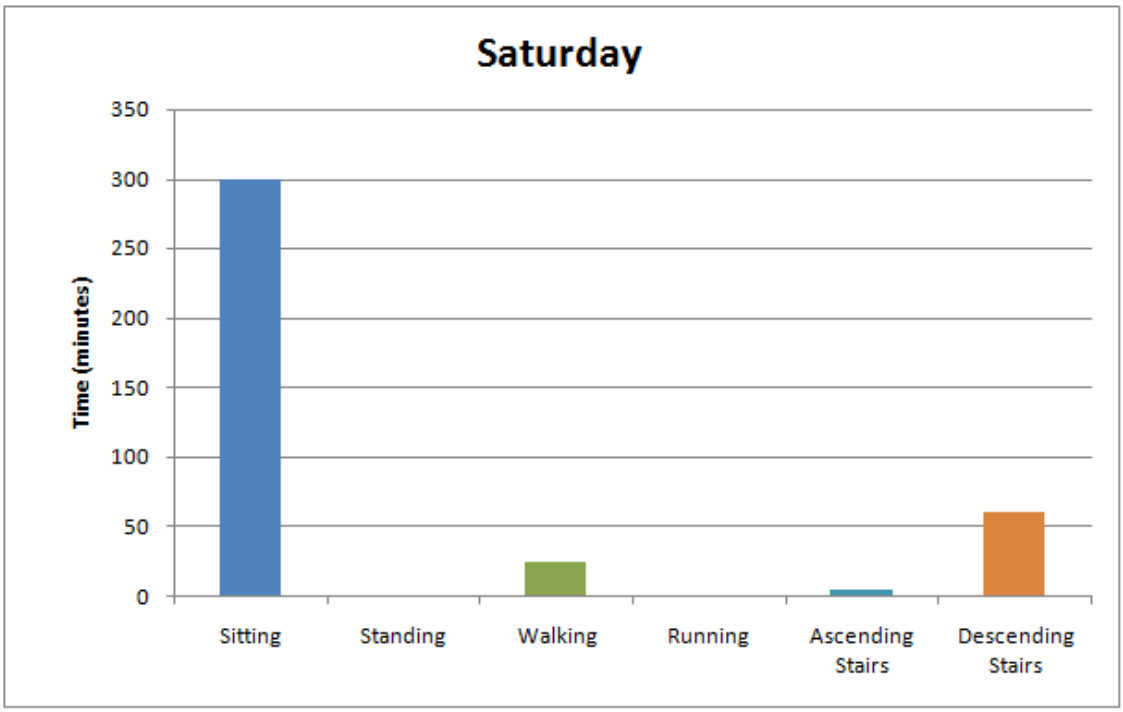

Figure 14: User 197: Saturday Results

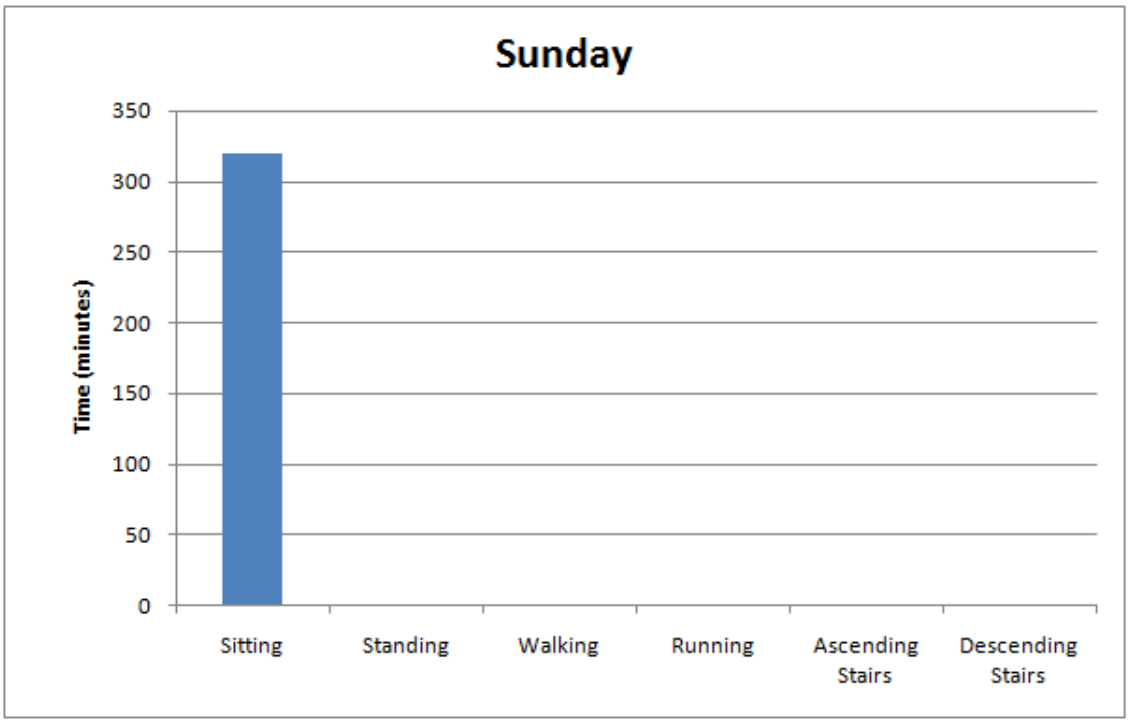

Figure 15: User 197: Sunday Results

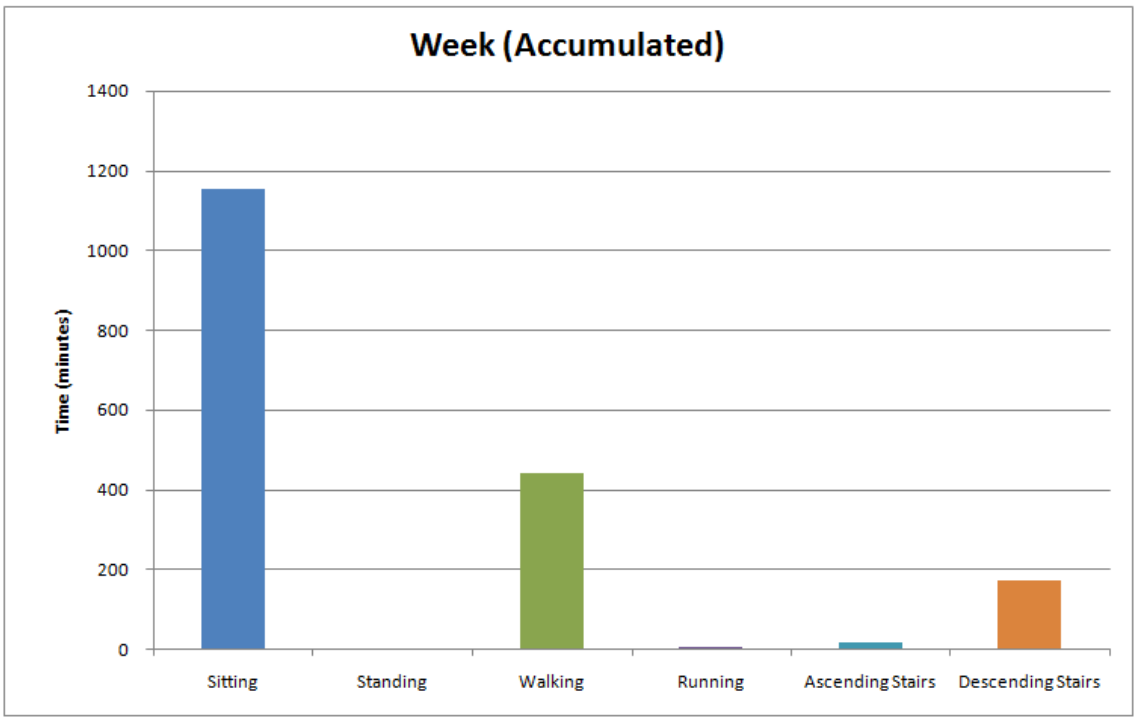

Figure 16: User 197: Week Results

8 Nutrition Service Results

TO BE PROVIDED BY UPM

9 Social Network Service Results

TO BE PROVIDED by PlanetMedia

10 Conclusions

TO BE PROVIDED By UNIGE after 7-9 is completed

References

[aaa, 2011] if needed