

Dataset is organized a MongoDB instance composed by 10 tables in 6 different collections (see diagram below). The database has an API REST interface. For querying correctly, and to be authorized to do that, you must own an API key (obtained after your registration) and wait for the challenge official launch on 1st October 2021.

 USER ID: MDS000

ACCEPTABILITY

SOCIODEMOGRAPHIC	
record_id	MDS000
Questionnaire	sociodemo
gender	1
year_of_birth	1947
educational_level	2
technology_level	1
living_environment	1
living_conditions	1
living_status	1
date_of_termination	11/7/18
Date_of_finalization	15/1/19
Device	Own mobile
Status	Dropout

ACCEPTABILITY SPQ*		
ID	MDS000	
Instance	1	3
Q1	6	9
Q2		5
Q3	5	8
Q4		5
Q5	7	9
Q6		5

ACCEPTABILITY UTAUT	
ID	MDS000
ee1_my_interaction_with_th	4
ee2_it_is_easy_for_me_to_b	6
ee3_i_find_the_iot_device	6
ee4_learning_to_operate_th	6
pe1_i_find_the_iot_device	3
pe2_using_the_iot_device_e	4
pe3_using_the_iot_device_i	6
pe4_if_i_use_the_iot_devic	3
at1_using_the_iot_device_i	6
at2_the_iot_device_makes_s	6
at3_working_with_the_iot_d	3
at4_i_like_working_using_w	4
si1_people_who_influence_m	2
si2_people_who_are_importa	5
si3_professors_in_my_class	6
si4_in_general_the_doctor	7
fc1_i_have_the_resources_n	3
fc2_i_have_the_knowledge_n	4
fc3_the_iot_device_is_not	4
fc4_a_specific_person_or_g	7
se1_i_can_complete_a_job_o	7
se2_i_can_complete_a_job_o	3
se3_i_can_complete_a_job_o	4
se4_i_can_complete_a_job_o	5
ax1_i_feel_apprehensive_ab	5
ax2_it_scares_me_to_think	6
ax3_i_hesitate_to_use_the	3
ax4_the_iot_device_is_some	4
bi1_i_intend_to_use_the_io	5
bi2_i_predict_i_would_use	5
bi3_i_plan_to_use_the_iot	5

USER PHENOTYPE			
uid	MDS000		
start	19/12/19 17:16	19/12/19 17:16	19/12/19 17:22
log	Brain_Games/Go_to_Cognitiv_e_training	Brain_Games/Cognitiv_e_training/Go_to_Word_Search_game	Brain_Games/Cognitive_training/Word_search_completed

QUALITY OF LIFE

QUALITY OF LIFE	
ID	MDS000
Questionnaire	EQ5D3L
Instance	1
Mobility	1
Self-care	1
UsualActivities	1
Pain	1
Anxiety	2

UCLA*2	
ID	MDS000
Questionnaire	EQ5D3L
Instance	3
Q1	4
Q2	2
...	...
Q19	1
!20	2

APPLICATION MEASUREMENTS

PHYSICAL ACTIVITY		
uid	MDS000	
start	21/3/19 0:02	12/12/18 21:02
solved	0	0
type	upperlimbs	upperlimbs

FINGER TAPPING	
uid	MDS000
start	6/2/19 19:53
taps	3
errors	4
mean_rt	1067,14
std_rt	633,49
max_rt	2000
min_rt	491
solved	False
bilateral	False
type	fta_tapOnTheDrumOrNot

BRAIN GAMES	
uid	MDS000
start	5/7/18 10:58
difficulty	2
duration	21
solved	0
type	puzzle

MINDFULNESS	
uid	MDS000
start	6/7/18 18:29
status_practice	INCOMPLETE
duration	27

Score

Data acquisitions follow a well-defined protocol composed of regularly scheduled moments, where participants must acquire data in the study. Furthermore, each scheduled data acquisition may comprise the actual measurement of one or more variables, such as physiological (e.g., heart rate, BP, weight) or activity variables (e.g., physical activity, app interactions, etc.) and they may or may not be effectively implemented by the study participant. Additionally, some context information (e.g. the date) will be provided.

Let the consecutive data acquisitions in the remote monitoring protocol be scheduled for time instances $i=1, \dots, n$. Assume that each data acquisition is comprised of m variables (e.g., heart rate, BP, weight, etc.). Hence, let $x_{ij}, j=1, \dots, m$, be the acquisition of variable j in time instance i .

The goal of the challenge is, given a window of $n=12$ consecutive scheduled data acquisitions, to predict the adherence during the forthcoming 3 scheduled data acquisitions. The adherence during the next 3 scheduled acquisitions is considered:

- **LOW** if number of effective acquisitions is 0 or 1 during the period.
- **HIGH** if it is 2 or 3 during the period.

In the context of this challenge, it is considered that a planned acquisition has been effectively implemented by a participant if at least one of the variables scheduled for measurement has been received.

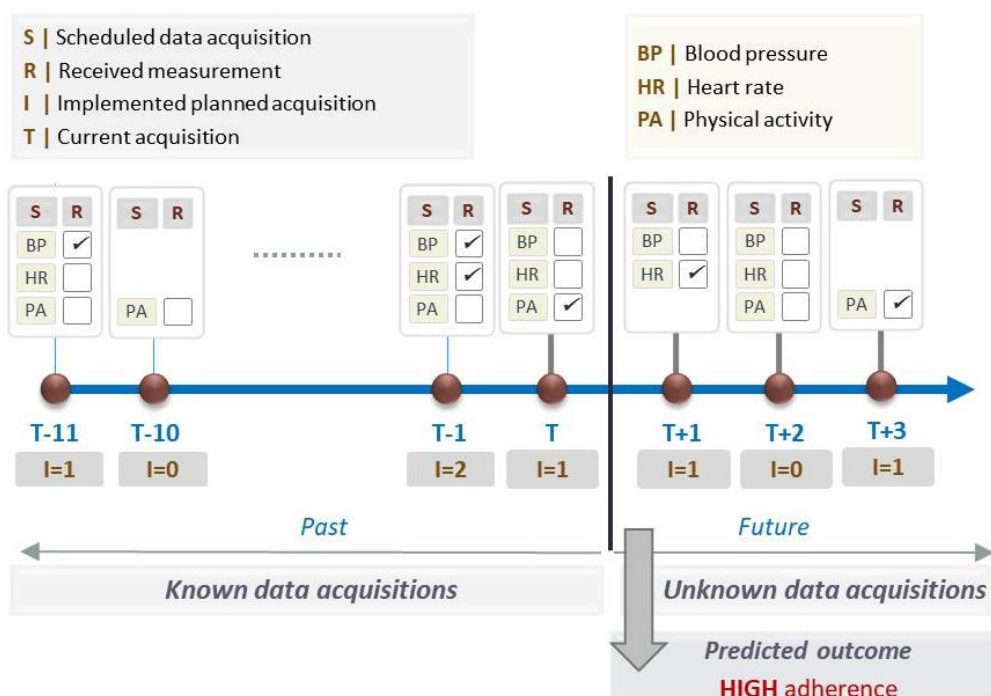
The score of each prediction will be determined by the geometric mean of the achieved sensitivity (SE) and specificity (SP), i.e.,

$$\text{score} = \text{GE} = \sqrt{\text{SE} \times \text{SP}}$$

where:

- **TP** – Predicted adherence is HIGH and ground truth adherence is HIGH
- **FP** – Predicted adherence is HIGH and ground truth adherence is LOW
- **TN** – Predicted adherence is LOW and ground truth adherence is LOW
- **FN** – Predicted adherence is LOW and ground truth adherence is HIGH

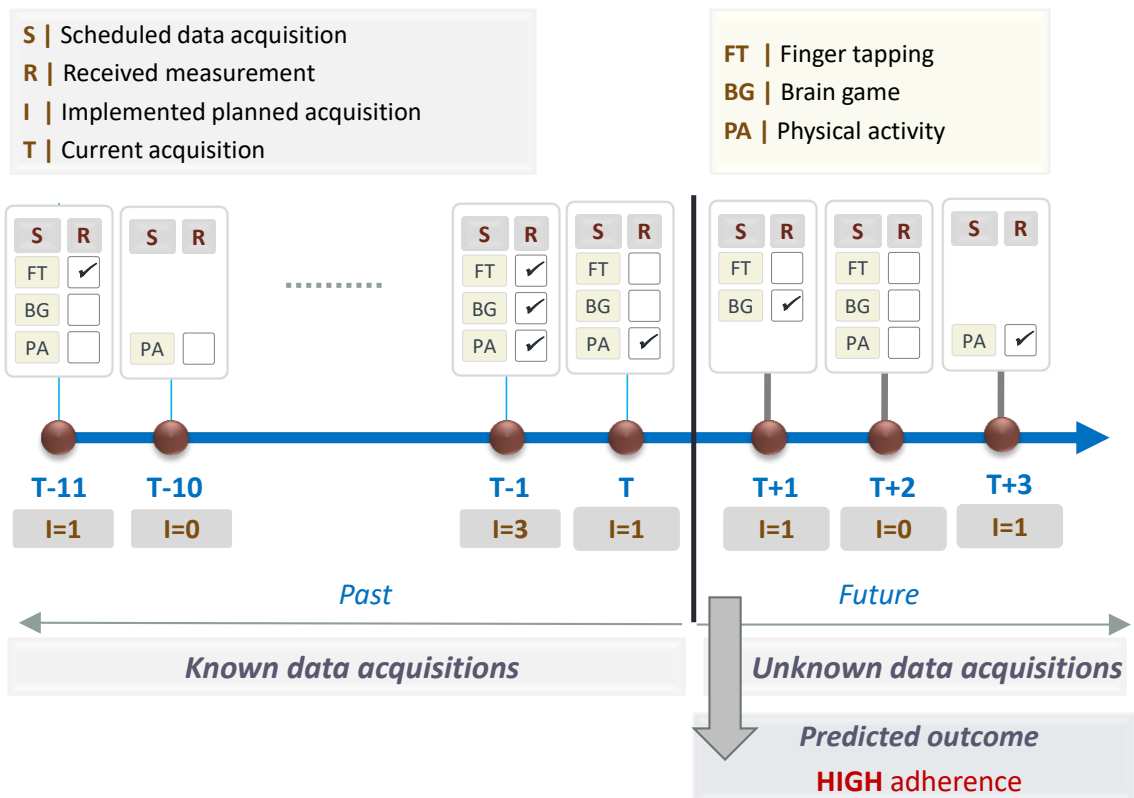
The global adherence score will be determined by the average of the GE obtained for each prediction.



Example for the specific dataset provided in phase 1

For phase 1 the specific dataset was collected in Spain using the following protocol:

- **Type of periodic activities:** brain training games, finger tapping, physical activity, mindfulness, digital phenotyping.
- **Frequency of acquisition of periodic activities:** each activity should be acquired twice a week (as previously communicated to participants on 8th October and 25th October).



In the example shown, it is observed that in the last $n=12$ planned acquisitions, were effectively implemented the acquisitions in the instants (T-11, T-1 and T); for instant (T-10) no activity was implemented; other instants are not shown.

The goal is to predict, in next $n=3$ planned acquisition instances, the level of the adherence (LOW or HIGH). In this example the level of adherence is HIGH.