

# Fall detection project

Types of falls and instructions for their simulation

(Important)!!! Please Notice: You may need to recollect the data if you don't follow the instructions below

- 1. Please wear a shirt
- 2. Please simulate 20 times for each event (10 for indoor and 10 for outdoor)
- 3. Please wait three seconds before each movement (three times of flash for the red recording light)
- 4. Please make sure that two cameras are recording simultaneously
- 5. Most important: please protect yourself during the data collection

## List of activities

- Most important falls

Category	No.	Name	Symbol	Description
Forward	1	Front-lying	FL	1. From vertical going forward to the floor with arm protection and lying down
	2	Front-knees-lying	FKL	2. From vertical going down on the knees and then lying on the floor
Backward	3	Back-lying	BL	3. From vertical going back direction and lying on the floor
	4	Back-sitting-lying	BS	4. From vertical going back direction and lying on the floor
Lateral	5	Right-side	RS	5. From vertical falling in the right-lateral direction ending lying
	6	Left-side	LS	6. From vertical falling in the left-lateral direction ending lying
Down	7	Syncope	Sy	7. From standing going on the floor following a vertical trajectory ending lying on the floor
	8	Syncope-Wall	SW	8. From standing and going down slowly slipping on a wall

- Non-falls which are similar to falls

Category	No.	Name	Symbol	Description
Lying	1	Lying-bed	LB	From vertical lying on the bed and keeping the position for several seconds
Rising	2	Rising-bed	RB	From lying to sitting or standing
Siting(choosing one or all)	3	Sitting-bed	SB	From standing to sitting on the bed
	4	Sitting-chair	SC	From standing to sitting on the chair
	5	Sitting-sofa	SS	From standing to sitting on the sofa
Bending	6	Bending-Floor	BF	From standing to bending
Limp	7	Limp	LI	Walking with a limp
stumble	8	Stumble	ST	trip or momentarily lose one's balance; almost fall
Squatting-down	9	Squatting-down	SD	Going down, then up

- Regular activities

Category	No.	Symbol	Description
Walking	1	Wa	10 minutes (5 minutes indoor and 5 minutes outdoor)
Standing	2	St	10 minutes (5 minutes indoor and 5 minutes outdoor)
Sitting	3	Si	10 minutes (5 minutes indoor and 5 minutes outdoor)

## Instructions for simulation

- Time of voice of falls 1. Most of the falls will last 10 - 15 seconds, you can also stay in the floor after you fall to simulate that you lost the ability to move. Please also simulate the voice when you fall down, because the audio is also important.
- Location: indoor and outdoor
  - Indoor: living room, kitchen, bathroom, corridor, etc
  - Outdoor: street, park, countryside, etc
- With the help of different things
  1. Falls can also be acted with different things, such as fall from floor, fall from chair, fall from bed
  2. In the beginning, the person is standing. At the end, his/her head is stuck on the floor
  3. A person falls along one direction and the head and the center of mass move along
  4. The height of the head varies from the height while standing and the height of the floor
  5. During the fall the head is in free-fall
  6. After the fall the head lays in a virtual circle that is centered in the positions of the feet before the fall and has radius the height of the height
- Data storage and transfer

Data will be stored on the SD card of the camera automatically. There are two main methods to transfer the data to us. You can also choose any other convenient method to you.

  1. One is you can download the data from your smartphone and upload it to google drive or other platform.
  2. Second way is that I can come to here to copy the data by myself every week or several days.
- Procedure

You can repeat the movement for ten minutes or longer consistently. Since every movement only last several seconds, you can use your hand to cover the camera to make some black images so that we can divide each movement later by those black images.
- Number of simulation 20 falls for each type of falls and 30 minutes data for normal activities which can be split to small clips later.