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Supplementary Tables to the doctoral thesis: Trust and Fluency in Industrial Human-Robot Interaction - Virtual Reality Study of Human Behaviour

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0.1 Description

This file provides supplementary tables to the doctoral thesis written by Piotr Frątczak and titled: **Trust and Fluency in Industrial Human-Robot Interaction - Virtual Reality Study of Human Behaviour**.

0.2 Supplementary data for Chapter 4

The following tables present the motion data for the participants clustered using the four clustering methods, which were not presented in the thesis:

1. dichotomy (di3) - dividing participants into three equal groups
2. k-means (km2) - dividing participants into two groups with starting conditions at the maximum and minimum of the data
3. k-means (km3-med) - dividing participants into three groups with starting conditions at the maximum, minimum and median of data
4. k-means (km3-me) - dividing participants into three groups with starting conditions at the maximum, minimum and mean of data

Description of abbreviations:

Part1 - idle robot

Part2 - slow predictable

Part3 - fast predictable

Part4 - slow chaotic

Part5 - fast chaotic

Part6 - all random

R - responders

N-R - non-responders

C - control group

NCS - experiment with no control strategies

CS - experiment with control strategies

Table 1: Motion features of the NCS group clustered using di3 method

Feature description	Group	Part1	Part2	Part3	Part4	Part5	Part6
Change of proximity to the robot [m]	R	0.00 ± 0.00	-0.01 ± 0.02	-0.07 ± 0.02	-0.08 ± 0.03	-0.10 ± 0.05	-0.09 ± 0.05
	N-R	0.00 ± 0.00	-0.01 ± 0.01	-0.02 ± 0.01	-0.02 ± 0.03	-0.03 ± 0.03	-0.02 ± 0.03
	C	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.02	0.00 ± 0.02	0.00 ± 0.02	0.00 ± 0.03
Relative angular velocity of the Headset [%]	R	0.0 ± 0.0	4.9 ± 20.0	5.0 ± 17.1	-3.9 ± 10.5	3.9 ± 17.7	6.1 ± 20.0
	N-R	0.0 ± 0.0	8.1 ± 8.7	15.7 ± 24.0	2.7 ± 22.9	18.1 ± 11.6	5.2 ± 20.5
	C	0.0 ± 0.0	3.9 ± 11.3	-0.9 ± 14.6	-2.6 ± 15.4	-1.5 ± 5.4	-8.3 ± 13.8
Absolute percentage of the Headset movement ratio [%]	R	0.0 ± 0.0	11.4 ± 4.1	15.3 ± 10.2	12.2 ± 17.9	15.4 ± 19.3	16.7 ± 9.0
	N-R	0.0 ± 0.0	4.9 ± 8.5	17.0 ± 11.2	12.0 ± 16.1	10.2 ± 12.4	6.4 ± 10.8
	C	0.0 ± 0.0	-6.0 ± 9.7	-2.4 ± 8.8	-10.1 ± 12.5	-10.4 ± 18.1	-15.2 ± 20.6
Relative controller velocity [%]	R	0.0 ± 0.0	2.3 ± 22.5	0.3 ± 16.6	0.5 ± 17.5	6.2 ± 16.0	5.9 ± 18.4
	N-R	0.0 ± 0.0	-4.6 ± 8.7	-5.0 ± 14.1	-5.1 ± 15.2	0.1 ± 20.4	11.7 ± 13.2
	C	0.0 ± 0.0	3.8 ± 18.1	5.4 ± 12.0	12.2 ± 16.9	15.2 ± 22.9	20.2 ± 23.3
Relative controller acceleration [%]	R	0.0 ± 0.0	7.6 ± 36.0	7.1 ± 25.9	7.6 ± 20.5	14.2 ± 23.3	20.8 ± 34.0
	N-R	0.0 ± 0.0	-5.9 ± 9.0	-5.1 ± 15.8	-1.7 ± 10.3	0.1 ± 21.2	6.7 ± 16.2
	C	0.0 ± 0.0	4.7 ± 14.1	14.2 ± 14.9	17.6 ± 15.3	18.0 ± 24.6	21.4 ± 26.0
Absolute percentage mistakes ratio [%]	R	0.0 ± 0.0	-14.1 ± 15.4	-22.3 ± 12.0	-11.7 ± 13.4	-9.6 ± 16.0	-20.4 ± 13.7
	N-R	0.0 ± 0.0	0.0 ± 15.4	-1.8 ± 12.8	0.6 ± 20.7	4.4 ± 17.0	-5.1 ± 15.7
	C	0.0 ± 0.0	-4.1 ± 10.5	-4.5 ± 11.6	-1.7 ± 10.7	-7.4 ± 13.6	-6.8 ± 11.1
Relative response time [%]	R	0.0 ± 0.0	3.0 ± 14.9	3.7 ± 19.4	3.8 ± 16.1	5.6 ± 15.2	11.6 ± 12.9
	N-R	0.0 ± 0.0	8.6 ± 13.9	8.2 ± 6.5	9.0 ± 15.1	6.3 ± 14.1	11.0 ± 11.1
	C	0.0 ± 0.0	4.5 ± 12.7	-0.6 ± 13.9	3.9 ± 9.9	4.1 ± 14.4	1.6 ± 10.8

Table 2: Motion features of the CS group clustered using di3 method

Feature description	Group	Part1	Part2	Part3	Part4	Part5	Part6
Change of proximity to the robot [m]	R	0.00 ± 0.00	-0.02 ± 0.02	-0.03 ± 0.01	-0.06 ± 0.03	-0.05 ± 0.04	-0.04 ± 0.03
	N-R	0.00 ± 0.00	0.00 ± 0.01	-0.01 ± 0.02	0.00 ± 0.03	0.01 ± 0.04	0.02 ± 0.03
	C	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.02	0.00 ± 0.02	0.00 ± 0.02	0.00 ± 0.03
Relative angular velocity of the Headset [%]	R	0.0 ± 0.0	6.6 ± 10.2	3.3 ± 21.1	-9.1 ± 11.5	-14.0 ± 6.9	0.1 ± 20.3
	N-R	0.0 ± 0.0	3.4 ± 30.3	-11.6 ± 36.7	-15.2 ± 33.2	-12.2 ± 30.4	-14.0 ± 30.1
	C	0.0 ± 0.0	3.9 ± 11.3	-0.9 ± 14.6	-2.6 ± 15.4	-1.5 ± 5.4	-8.3 ± 13.8
Absolute percentage of the Headset movement ratio [%]	R	0.0 ± 0.0	15.4 ± 8.2	5.6 ± 8.3	14.3 ± 9.9	10.4 ± 12.8	11.3 ± 14.4
	N-R	0.0 ± 0.0	4.2 ± 8.8	-1.7 ± 8.0	-0.9 ± 7.2	-0.0 ± 1.7	-3.5 ± 1.1
	C	0.0 ± 0.0	-6.0 ± 9.7	-2.4 ± 8.8	-10.1 ± 12.5	-10.4 ± 18.1	-15.2 ± 20.6
Relative controller velocity [%]	R	0.0 ± 0.0	-3.2 ± 7.3	12.0 ± 14.3	1.6 ± 9.9	7.1 ± 9.5	6.0 ± 12.1
	N-R	0.0 ± 0.0	5.1 ± 16.1	-1.0 ± 25.4	-5.6 ± 20.5	3.9 ± 26.9	-1.7 ± 24.9
	C	0.0 ± 0.0	3.8 ± 18.1	5.4 ± 12.0	12.2 ± 16.9	15.2 ± 22.9	20.2 ± 23.3
Relative controller acceleration [%]	R	0.0 ± 0.0	-7.7 ± 2.2	16.6 ± 10.0	7.0 ± 11.0	9.7 ± 13.1	10.1 ± 13.2
	N-R	0.0 ± 0.0	2.4 ± 16.9	3.9 ± 31.6	-5.0 ± 20.0	1.2 ± 27.1	-0.8 ± 23.3
	C	0.0 ± 0.0	4.7 ± 14.1	14.2 ± 14.9	17.6 ± 15.3	18.0 ± 24.6	21.4 ± 26.0
Absolute percentage mistakes ratio [%]	R	0.0 ± 0.0	-6.3 ± 14.0	-4.6 ± 14.0	1.9 ± 8.8	8.9 ± 7.7	3.3 ± 6.9
	N-R	0.0 ± 0.0	-6.6 ± 8.1	-6.7 ± 12.1	-0.4 ± 14.9	2.5 ± 9.8	-11.8 ± 7.7
	C	0.0 ± 0.0	-4.1 ± 10.5	-4.5 ± 11.6	-1.7 ± 10.7	-7.4 ± 13.6	-6.8 ± 11.1
Relative response time [%]	R	0.0 ± 0.0	-4.8 ± 10.3	-7.7 ± 3.9	-1.2 ± 12.5	-7.4 ± 14.0	-0.4 ± 11.4
	N-R	0.0 ± 0.0	-4.3 ± 19.4	-5.3 ± 13.1	3.7 ± 20.0	2.6 ± 12.9	0.7 ± 16.2
	C	0.0 ± 0.0	4.5 ± 12.7	-0.6 ± 13.9	3.9 ± 9.9	4.1 ± 14.4	1.6 ± 10.8

Table 3: Motion features of the NCS group clustered using knn2 method

Feature description	Group	Part1	Part2	Part3	Part4	Part5	Part6
Change of proximity to the robot [m]	R	0.00 ± 0.00	-0.01 ± 0.02	-0.07 ± 0.02	-0.08 ± 0.03	-0.10 ± 0.05	-0.09 ± 0.05
	N-R	0.00 ± 0.00	-0.01 ± 0.01	-0.02 ± 0.02	-0.03 ± 0.03	-0.04 ± 0.04	-0.03 ± 0.04
	C	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.02	0.00 ± 0.02	0.00 ± 0.02	0.00 ± 0.03
Relative angular velocity of the Headset [%]	R	0.0 ± 0.0	4.9 ± 20.0	5.0 ± 17.1	-3.9 ± 10.5	3.9 ± 17.7	6.1 ± 20.0
	N-R	0.0 ± 0.0	2.8 ± 14.7	8.7 ± 24.2	-2.8 ± 19.3	5.9 ± 19.3	4.6 ± 22.6
	C	0.0 ± 0.0	3.9 ± 11.3	-0.9 ± 14.6	-2.6 ± 15.4	-1.5 ± 5.4	-8.3 ± 13.8
Absolute percentage of the Headset movement ratio [%]	R	0.0 ± 0.0	11.4 ± 4.1	15.3 ± 10.2	12.2 ± 17.9	15.4 ± 19.3	16.7 ± 9.0
	N-R	0.0 ± 0.0	4.5 ± 12.7	12.7 ± 13.2	10.7 ± 13.9	9.8 ± 13.6	6.5 ± 12.0
	C	0.0 ± 0.0	-6.0 ± 9.7	-2.4 ± 8.8	-10.1 ± 12.5	-10.4 ± 18.1	-15.2 ± 20.6
Relative controller velocity [%]	R	0.0 ± 0.0	2.3 ± 22.5	0.3 ± 16.6	0.5 ± 17.5	6.2 ± 16.0	5.9 ± 18.4
	N-R	0.0 ± 0.0	-1.1 ± 11.6	2.0 ± 17.2	1.0 ± 17.4	8.1 ± 16.9	9.8 ± 18.4
	C	0.0 ± 0.0	3.8 ± 18.1	5.4 ± 12.0	12.2 ± 16.9	15.2 ± 22.9	20.2 ± 23.3
Relative controller acceleration [%]	R	0.0 ± 0.0	7.6 ± 36.0	7.1 ± 25.9	7.6 ± 20.5	14.2 ± 23.3	20.8 ± 34.0
	N-R	0.0 ± 0.0	-0.8 ± 11.7	2.9 ± 18.6	0.1 ± 17.5	11.2 ± 18.9	12.4 ± 19.4
	C	0.0 ± 0.0	4.7 ± 14.1	14.2 ± 14.9	17.6 ± 15.3	18.0 ± 24.6	21.4 ± 26.0
Absolute percentage mistakes ratio [%]	R	0.0 ± 0.0	-14.1 ± 15.4	-22.3 ± 12.0	-11.7 ± 13.4	-9.6 ± 16.0	-20.4 ± 13.7
	N-R	0.0 ± 0.0	-6.2 ± 11.6	-10.7 ± 18.2	-4.9 ± 19.3	-3.5 ± 20.5	-11.5 ± 16.1
	C	0.0 ± 0.0	-4.1 ± 10.5	-4.5 ± 11.6	-1.7 ± 10.7	-7.4 ± 13.6	-6.8 ± 11.1
Relative response time [%]	R	0.0 ± 0.0	3.0 ± 14.9	3.7 ± 19.4	3.8 ± 16.1	5.6 ± 15.2	11.6 ± 12.9
	N-R	0.0 ± 0.0	3.6 ± 14.1	4.4 ± 14.2	8.0 ± 16.8	6.0 ± 15.6	10.7 ± 19.6
	C	0.0 ± 0.0	4.5 ± 12.7	-0.6 ± 13.9	3.9 ± 9.9	4.1 ± 14.4	1.6 ± 10.8

Table 4: Motion features of the CS group clustered using km2 method

Feature description	Group	Part1	Part2	Part3	Part4	Part5	Part6
Change of proximity to the robot [m]	R	0.00 ± 0.00	-0.02 ± 0.02	-0.03 ± 0.02	-0.06 ± 0.03	-0.06 ± 0.04	-0.05 ± 0.03
	N-R	0.00 ± 0.00	-0.01 ± 0.01	-0.02 ± 0.02	-0.03 ± 0.04	-0.03 ± 0.06	-0.03 ± 0.06
	C	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.02	0.00 ± 0.02	0.00 ± 0.02	0.00 ± 0.03
Relative angular velocity of the Headset [%]	R	0.0 ± 0.0	9.9 ± 13.2	8.6 ± 24.6	-3.1 ± 20.0	-14.0 ± 6.9	0.1 ± 20.3
	N-R	0.0 ± 0.0	6.9 ± 22.1	-12.3 ± 20.7	-10.5 ± 12.4	-3.2 ± 24.4	-7.1 ± 23.4
	C	0.0 ± 0.0	3.9 ± 11.3	-0.9 ± 14.6	-2.6 ± 15.4	-1.5 ± 5.4	-8.3 ± 13.8
Absolute percentage of the Headset movement ratio [%]	R	0.0 ± 0.0	18.5 ± 11.5	5.6 ± 8.3	14.3 ± 9.9	15.5 ± 18.5	17.0 ± 20.9
	N-R	0.0 ± 0.0	4.4 ± 7.4	5.6 ± 10.1	7.2 ± 9.9	7.5 ± 8.3	2.2 ± 11.3
	C	0.0 ± 0.0	-6.0 ± 9.7	-2.4 ± 8.8	-10.1 ± 12.5	-10.4 ± 18.1	-15.2 ± 20.6
Relative controller velocity [%]	R	0.0 ± 0.0	-3.2 ± 14.3	11.8 ± 13.1	-1.9 ± 13.4	4.9 ± 10.7	4.5 ± 12.0
	N-R	0.0 ± 0.0	5.7 ± 19.1	6.2 ± 25.7	3.1 ± 24.1	10.6 ± 32.5	15.5 ± 33.7
	C	0.0 ± 0.0	3.8 ± 18.1	5.4 ± 12.0	12.2 ± 16.9	15.2 ± 22.9	20.2 ± 23.3
Relative controller acceleration [%]	R	0.0 ± 0.0	-7.7 ± 2.2	14.6 ± 10.6	2.8 ± 15.6	7.5 ± 13.6	7.1 ± 14.9
	N-R	0.0 ± 0.0	0.9 ± 13.1	5.9 ± 26.5	2.2 ± 22.8	1.3 ± 23.6	7.9 ± 23.0
	C	0.0 ± 0.0	4.7 ± 14.1	14.2 ± 14.9	17.6 ± 15.3	18.0 ± 24.6	21.4 ± 26.0
Absolute percentage mistakes ratio [%]	R	0.0 ± 0.0	-3.9 ± 14.5	-1.7 ± 15.4	4.2 ± 10.5	9.3 ± 7.2	2.7 ± 6.5
	N-R	0.0 ± 0.0	-10.3 ± 5.4	-5.7 ± 10.2	0.1 ± 11.5	1.2 ± 8.6	-6.9 ± 11.5
	C	0.0 ± 0.0	-4.1 ± 10.5	-4.5 ± 11.6	-1.7 ± 10.7	-7.4 ± 13.6	-6.8 ± 11.1
Relative response time [%]	R	0.0 ± 0.0	0.3 ± 13.0	-13.1 ± 9.9	-0.6 ± 11.7	-7.5 ± 13.0	3.7 ± 6.9
	N-R	0.0 ± 0.0	1.8 ± 9.3	-2.9 ± 9.9	6.5 ± 14.7	0.0 ± 12.5	4.4 ± 12.7
	C	0.0 ± 0.0	4.5 ± 12.7	-0.6 ± 13.9	3.9 ± 9.9	4.1 ± 14.4	1.6 ± 10.8

Table 5: Motion features of the NCS group clustered using km3-med method

Feature description	Group	Part1	Part2	Part3	Part4	Part5	Part6
Change of proximity to the robot [m]	R	0.00 ± 0.00	-0.01 ± 0.02	-0.07 ± 0.02	-0.08 ± 0.03	-0.10 ± 0.05	-0.09 ± 0.05
	N-R	0.00 ± 0.00	-0.01 ± 0.01	-0.02 ± 0.01	-0.02 ± 0.03	-0.03 ± 0.03	-0.02 ± 0.03
	C	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.02	0.00 ± 0.02	0.00 ± 0.02	0.00 ± 0.03
Relative angular velocity of the Headset [%]	R	0.0 ± 0.0	4.9 ± 20.0	5.0 ± 17.1	-3.9 ± 10.5	3.9 ± 17.7	6.1 ± 20.0
	N-R	0.0 ± 0.0	8.1 ± 8.7	15.7 ± 24.0	2.7 ± 22.9	18.1 ± 11.6	5.2 ± 20.5
	C	0.0 ± 0.0	3.9 ± 11.3	-0.9 ± 14.6	-2.6 ± 15.4	-1.5 ± 5.4	-8.3 ± 13.8
Absolute percentage of the Headset movement ratio [%]	R	0.0 ± 0.0	11.4 ± 4.1	15.3 ± 10.2	12.2 ± 17.9	15.4 ± 19.3	16.7 ± 9.0
	N-R	0.0 ± 0.0	4.9 ± 8.5	17.0 ± 11.2	12.0 ± 16.1	10.2 ± 12.4	6.4 ± 10.8
	C	0.0 ± 0.0	-6.0 ± 9.7	-2.4 ± 8.8	-10.1 ± 12.5	-10.4 ± 18.1	-15.2 ± 20.6
Relative controller velocity [%]	R	0.0 ± 0.0	2.3 ± 22.5	0.3 ± 16.6	0.5 ± 17.5	6.2 ± 16.0	5.9 ± 18.4
	N-R	0.0 ± 0.0	-4.6 ± 8.7	-5.0 ± 14.1	-5.1 ± 15.2	0.1 ± 20.4	11.7 ± 13.2
	C	0.0 ± 0.0	3.8 ± 18.1	5.4 ± 12.0	12.2 ± 16.9	15.2 ± 22.9	20.2 ± 23.3
Relative controller acceleration [%]	R	0.0 ± 0.0	7.6 ± 36.0	7.1 ± 25.9	7.6 ± 20.5	14.2 ± 23.3	20.8 ± 34.0
	N-R	0.0 ± 0.0	-5.9 ± 9.0	-5.1 ± 15.8	-1.7 ± 10.3	0.1 ± 21.2	6.7 ± 16.2
	C	0.0 ± 0.0	4.7 ± 14.1	14.2 ± 14.9	17.6 ± 15.3	18.0 ± 24.6	21.4 ± 26.0
Absolute percentage mistakes ratio [%]	R	0.0 ± 0.0	-14.1 ± 15.4	-22.3 ± 12.0	-11.7 ± 13.4	-9.6 ± 16.0	-20.4 ± 13.7
	N-R	0.0 ± 0.0	0.0 ± 15.4	-1.8 ± 12.8	0.6 ± 20.7	4.4 ± 17.0	-5.1 ± 15.7
	C	0.0 ± 0.0	-4.1 ± 10.5	-4.5 ± 11.6	-1.7 ± 10.7	-7.4 ± 13.6	-6.8 ± 11.1
Relative response time [%]	R	0.0 ± 0.0	3.0 ± 14.9	3.7 ± 19.4	3.8 ± 16.1	5.6 ± 15.2	11.6 ± 12.9
	N-R	0.0 ± 0.0	8.6 ± 13.9	8.2 ± 6.5	9.0 ± 15.1	6.3 ± 14.1	11.0 ± 11.1
	C	0.0 ± 0.0	4.5 ± 12.7	-0.6 ± 13.9	3.9 ± 9.9	4.1 ± 14.4	1.6 ± 10.8

Table 6: Motion features of the CS group clustered using km3-med method

Feature description	Group	Part1	Part2	Part3	Part4	Part5	Part6
Change of proximity to the robot [m]	R	0.00 ± 0.00	-0.02 ± 0.02	-0.03 ± 0.01	-0.06 ± 0.03	-0.05 ± 0.04	-0.04 ± 0.03
	N-R	0.00 ± 0.00	0.00 ± 0.01	-0.01 ± 0.02	0.01 ± 0.03	0.01 ± 0.04	0.02 ± 0.03
	C	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.02	0.00 ± 0.02	0.00 ± 0.02	0.00 ± 0.03
Relative angular velocity of the Headset [%]	R	0.0 ± 0.0	6.6 ± 10.2	3.3 ± 21.1	-9.1 ± 11.5	-14.0 ± 6.9	0.1 ± 20.3
	N-R	0.0 ± 0.0	-0.2 ± 32.5	-11.4 ± 41.0	-14.0 ± 37.0	-11.0 ± 33.8	-12.6 ± 33.4
	C	0.0 ± 0.0	3.9 ± 11.3	-0.9 ± 14.6	-2.6 ± 15.4	-1.5 ± 5.4	-8.3 ± 13.8
Absolute percentage of the Headset movement ratio [%]	R	0.0 ± 0.0	15.4 ± 8.2	5.6 ± 8.3	14.3 ± 9.9	10.4 ± 12.8	11.3 ± 14.4
	N-R	0.0 ± 0.0	0.5 ± 4.1	-3.7 ± 7.6	-1.1 ± 8.3	0.6 ± 1.5	-3.5 ± 1.1
	C	0.0 ± 0.0	-6.0 ± 9.7	-2.4 ± 8.8	-10.1 ± 12.5	-10.4 ± 18.1	-15.2 ± 20.6
Relative controller velocity [%]	R	0.0 ± 0.0	-3.2 ± 7.3	12.0 ± 14.3	1.6 ± 9.9	7.1 ± 9.5	6.0 ± 12.1
	N-R	0.0 ± 0.0	1.7 ± 1.1	-1.7 ± 28.3	-7.9 ± 22.0	0.4 ± 28.5	-1.5 ± 27.8
	C	0.0 ± 0.0	3.8 ± 18.1	5.4 ± 12.0	12.2 ± 16.9	15.2 ± 22.9	20.2 ± 23.3
Relative controller acceleration [%]	R	0.0 ± 0.0	-7.7 ± 2.2	16.6 ± 10.0	7.0 ± 11.0	9.7 ± 13.1	10.1 ± 13.2
	N-R	0.0 ± 0.0	-1.9 ± 14.8	-1.4 ± 32.1	-7.8 ± 21.0	-0.4 ± 30.0	-0.2 ± 26.0
	C	0.0 ± 0.0	4.7 ± 14.1	14.2 ± 14.9	17.6 ± 15.3	18.0 ± 24.6	21.4 ± 26.0
Absolute percentage mistakes ratio [%]	R	0.0 ± 0.0	-6.3 ± 14.0	-4.6 ± 14.0	1.9 ± 8.8	8.9 ± 7.7	3.3 ± 6.9
	N-R	0.0 ± 0.0	-8.8 ± 3.8	-10.5 ± 8.6	-2.3 ± 15.8	0.1 ± 1.4	-9.9 ± 6.9
	C	0.0 ± 0.0	-4.1 ± 10.5	-4.5 ± 11.6	-1.7 ± 10.7	-7.4 ± 13.6	-6.8 ± 11.1
Relative response time [%]	R	0.0 ± 0.0	-4.8 ± 10.3	-7.7 ± 3.9	-1.2 ± 12.5	-7.4 ± 14.0	-0.4 ± 11.4
	N-R	0.0 ± 0.0	1.1 ± 3.8	-4.1 ± 14.3	2.5 ± 22.1	-0.2 ± 12.3	5.5 ± 12.4
	C	0.0 ± 0.0	4.5 ± 12.7	-0.6 ± 13.9	3.9 ± 9.9	4.1 ± 14.4	1.6 ± 10.8

Table 7: Motion features of the NCS group clustered using km3-me method

Feature description	Group	Part1	Part2	Part3	Part4	Part5	Part6
Change of proximity to the robot [m]	R	0.00 ± 0.00	-0.01 ± 0.01	-0.02 ± 0.02	-0.04 ± 0.04	-0.07 ± 0.07	-0.04 ± 0.04
	N-R	0.00 ± 0.00	-0.01 ± 0.01	-0.04 ± 0.03	-0.03 ± 0.02	-0.06 ± 0.06	-0.06 ± 0.05
	C	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.02	0.00 ± 0.02	0.00 ± 0.02	0.00 ± 0.03
Relative angular velocity of the Headset [%]	R	0.0 ± 0.0	3.4 ± 18.4	4.0 ± 27.8	-9.8 ± 20.8	-5.1 ± 19.2	0.3 ± 27.5
	N-R	0.0 ± 0.0	4.1 ± 14.6	14.6 ± 15.9	-3.8 ± 4.9	3.0 ± 19.9	1.2 ± 22.3
	C	0.0 ± 0.0	3.9 ± 11.3	-0.9 ± 14.6	-2.6 ± 15.4	-1.5 ± 5.4	-8.3 ± 13.8
Absolute percentage of the Headset movement ratio [%]	R	0.0 ± 0.0	7.0 ± 11.7	13.1 ± 15.1	7.2 ± 14.4	6.9 ± 15.5	8.6 ± 13.0
	N-R	0.0 ± 0.0	6.6 ± 11.8	17.3 ± 7.6	16.5 ± 14.8	11.9 ± 20.4	12.6 ± 1.8
	C	0.0 ± 0.0	-6.0 ± 9.7	-2.4 ± 8.8	-10.1 ± 12.5	-10.4 ± 18.1	-15.2 ± 20.6
Relative controller velocity [%]	R	0.0 ± 0.0	-0.8 ± 5.7	2.2 ± 11.6	0.5 ± 9.9	0.7 ± 8.2	16.0 ± 17.4
	N-R	0.0 ± 0.0	0.3 ± 8.0	5.4 ± 21.0	4.7 ± 20.1	4.3 ± 18.7	4.0 ± 18.0
	C	0.0 ± 0.0	3.8 ± 18.1	5.4 ± 12.0	12.2 ± 16.9	15.2 ± 22.9	20.2 ± 23.3
Relative controller acceleration [%]	R	0.0 ± 0.0	-3.2 ± 6.2	4.3 ± 8.3	0.1 ± 7.4	2.5 ± 11.3	15.9 ± 12.5
	N-R	0.0 ± 0.0	1.0 ± 13.6	2.7 ± 26.6	8.2 ± 28.4	9.4 ± 28.5	4.1 ± 20.3
	C	0.0 ± 0.0	4.7 ± 14.1	14.2 ± 14.9	17.6 ± 15.3	18.0 ± 24.6	21.4 ± 26.0
Absolute percentage mistakes ratio [%]	R	0.0 ± 0.0	-7.3 ± 11.9	-13.6 ± 15.5	-12.9 ± 20.0	-7.0 ± 22.2	-14.2 ± 19.7
	N-R	0.0 ± 0.0	-10.1 ± 9.3	-19.9 ± 18.0	-14.4 ± 14.2	-14.6 ± 10.0	-25.0 ± 15.8
	C	0.0 ± 0.0	-4.1 ± 10.5	-4.5 ± 11.6	-1.7 ± 10.7	-7.4 ± 13.6	-6.8 ± 11.1
Relative response time [%]	R	0.0 ± 0.0	10.9 ± 13.6	10.4 ± 19.4	13.7 ± 20.9	12.7 ± 17.7	19.0 ± 13.9
	N-R	0.0 ± 0.0	5.4 ± 5.8	9.3 ± 5.7	12.0 ± 12.0	8.2 ± 11.2	7.3 ± 13.2
	C	0.0 ± 0.0	4.5 ± 12.7	-0.6 ± 13.9	3.9 ± 9.9	4.1 ± 14.4	1.6 ± 10.8

Table 8: Motion features of the CS group clustered using km3-means method

Feature description	Group	Part1	Part2	Part3	Part4	Part5	Part6
Change of proximity to the robot [m]	R	0.00 ± 0.00	-0.02 ± 0.02	-0.03 ± 0.01	-0.06 ± 0.03	-0.05 ± 0.04	-0.04 ± 0.03
	N-R	0.00 ± 0.00	0.00 ± 0.01	-0.01 ± 0.02	0.01 ± 0.03	0.01 ± 0.04	0.02 ± 0.03
	C	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.02	0.00 ± 0.02	0.00 ± 0.02	0.00 ± 0.03
Relative angular velocity of the Headset [%]	R	0.0 ± 0.0	6.6 ± 10.2	3.3 ± 21.1	-9.1 ± 11.5	-14.0 ± 6.9	0.1 ± 20.3
	N-R	0.0 ± 0.0	-0.2 ± 32.5	-11.4 ± 41.0	-14.0 ± 37.0	-11.0 ± 33.8	-12.6 ± 33.4
	C	0.0 ± 0.0	3.9 ± 11.3	-0.9 ± 14.6	-2.6 ± 15.4	-1.5 ± 5.4	-8.3 ± 13.8
Absolute percentage of the Headset movement ratio [%]	R	0.0 ± 0.0	15.4 ± 8.2	5.6 ± 8.3	14.3 ± 9.9	10.4 ± 12.8	11.3 ± 14.4
	N-R	0.0 ± 0.0	0.5 ± 4.1	-3.7 ± 7.6	-1.1 ± 8.3	0.6 ± 1.5	-3.5 ± 1.1
	C	0.0 ± 0.0	-6.0 ± 9.7	-2.4 ± 8.8	-10.1 ± 12.5	-10.4 ± 18.1	-15.2 ± 20.6
Relative controller velocity [%]	R	0.0 ± 0.0	-3.2 ± 7.3	12.0 ± 14.3	1.6 ± 9.9	7.1 ± 9.5	6.0 ± 12.1
	N-R	0.0 ± 0.0	1.7 ± 1.1	-1.7 ± 28.3	-7.9 ± 22.0	0.4 ± 28.5	-1.5 ± 27.8
	C	0.0 ± 0.0	3.8 ± 18.1	5.4 ± 12.0	12.2 ± 16.9	15.2 ± 22.9	20.2 ± 23.3
Relative controller acceleration [%]	R	0.0 ± 0.0	-7.7 ± 2.2	16.6 ± 10.0	7.0 ± 11.0	9.7 ± 13.1	10.1 ± 13.2
	N-R	0.0 ± 0.0	-1.9 ± 14.8	-1.4 ± 32.1	-7.8 ± 21.0	-0.4 ± 30.0	-0.2 ± 26.0
	C	0.0 ± 0.0	4.7 ± 14.1	14.2 ± 14.9	17.6 ± 15.3	18.0 ± 24.6	21.4 ± 26.0
Absolute percentage mistakes ratio [%]	R	0.0 ± 0.0	-6.3 ± 14.0	-4.6 ± 14.0	1.9 ± 8.8	8.9 ± 7.7	3.3 ± 6.9
	N-R	0.0 ± 0.0	-8.8 ± 3.8	-10.5 ± 8.6	-2.3 ± 15.8	0.1 ± 1.4	-9.9 ± 6.9
	C	0.0 ± 0.0	-4.1 ± 10.5	-4.5 ± 11.6	-1.7 ± 10.7	-7.4 ± 13.6	-6.8 ± 11.1
Relative response time [%]	R	0.0 ± 0.0	-4.8 ± 10.3	-7.7 ± 3.9	-1.2 ± 12.5	-7.4 ± 14.0	-0.4 ± 11.4
	N-R	0.0 ± 0.0	1.1 ± 3.8	-4.1 ± 14.3	2.5 ± 22.1	-0.2 ± 12.3	5.5 ± 12.4
	C	0.0 ± 0.0	4.5 ± 12.7	-0.6 ± 13.9	3.9 ± 9.9	4.1 ± 14.4	1.6 ± 10.8

0.3 Supplementary data for Chapter 5

The following tables present the motion and physiological data for the participants clustered using the three clustering methods, which were not presented in the thesis:

1. dichotomy (di3) - dividing participants into three equal groups
2. k-means (km2) - dividing participants into two groups with starting conditions at the maximum and minimum of the data
3. self organizing maps (som3) - dividing participants into three groups

Description of abbreviations:

Part1 - slow robot

Part2 - fast robot making unexpected movements

Part3 - fast robot

Beg - beginning

End - ending

F - fluent participants

N-F - non-fluent participants

Table 9: Motion features of the participants clustered using di3 method

Feature description	Group	Part1		Part2		Part3	
		Beg.	End.	Beg.	End.	Beg.	End.
Perc. of concurrent time (CT)[%]	N-F	45.4 ± 5.3	38.5 ± 9.7	22.0 ± 4.8	12.8 ± 9.7	18.1 ± 10.0	12.4 ± 9.1
	F	51.1 ± 5.9	47.3 ± 4.6	30.6 ± 3.9	36.9 ± 11.7	49.2 ± 11.9	49.2 ± 5.9
Screwing time per screw (ST) [s]	N-F	4.71 ± 0.38	4.70 ± 0.43	4.80 ± 0.49	4.67 ± 0.43	4.68 ± 0.18	4.53 ± 0.28
	F	4.48 ± 0.24	4.34 ± 0.14	4.24 ± 0.41	4.37 ± 0.40	4.33 ± 0.24	4.36 ± 0.33
Bad contact time (BT)[s]	N-F	0.42 ± 0.16	0.41 ± 0.26	0.45 ± 0.21	0.38 ± 0.26	0.36 ± 0.31	0.42 ± 0.39
	F	0.61 ± 0.29	0.69 ± 0.37	0.62 ± 0.04	0.56 ± 0.30	0.60 ± 0.30	0.48 ± 0.21
Number of mistakes per screw (M)[~]	N-F	0.00 ± 0.00	0.07 ± 0.08	0.14 ± 0.12	0.07 ± 0.06	0.10 ± 0.09	0.00 ± 0.00
	F	0.00 ± 0.00	0.08 ± 0.08	0.20 ± 0.17	0.18 ± 0.14	0.31 ± 0.04	0.19 ± 0.15
Dist. from the plate at the drop time (DP)[m]	N-F	0.25 ± 0.03	0.24 ± 0.03	0.28 ± 0.03	0.28 ± 0.03	0.24 ± 0.03	0.28 ± 0.02
	F	0.25 ± 0.02	0.23 ± 0.04	0.26 ± 0.04	0.24 ± 0.04	0.18 ± 0.02	0.21 ± 0.02
Max velocity of the right hand (MV)[m/s]	N-F	0.47 ± 0.08	0.46 ± 0.12	0.55 ± 0.06	0.48 ± 0.20	0.39 ± 0.13	0.38 ± 0.21
	F	0.47 ± 0.12	0.47 ± 0.12	0.57 ± 0.11	0.56 ± 0.23	0.33 ± 0.05	0.38 ± 0.09
Max acc. of the right hand (MA)[m/s ²]	N-F	2.97 ± 0.77	2.98 ± 0.93	3.58 ± 0.43	3.02 ± 1.40	2.47 ± 0.95	2.03 ± 0.46
	F	2.92 ± 0.71	3.22 ± 0.99	4.02 ± 0.96	4.11 ± 1.52	2.83 ± 1.28	2.72 ± 0.87

Table 10: Physiological features of the participants clustered using di3 method

Feature description	Group	Part1		Part2		Part3	
		Beg.	End.	Beg.	End.	Beg.	End.
Heart rate (HR) [bpm]	N-F	81.5 ± 2.7	79.6 ± 4.6	78.4 ± 3.5	81.0 ± 6.0	79.2 ± 3.6	79.6 ± 8.6
	F	77.2 ± 9.6	76.1 ± 9.6	76.3 ± 9.2	76.9 ± 9.9	77.0 ± 10.0	77.7 ± 10.5
Standard deviation of NN (SDNN) [ms]	N-F	59.7 ± 14.9	60.6 ± 15.7	59.2 ± 13.0	63.2 ± 17.2	55.2 ± 6.9	53.8 ± 11.1
	F	40.6 ± 12.2	47.5 ± 18.8	46.5 ± 17.2	45.4 ± 17.7	46.9 ± 19.7	42.5 ± 15.2
Root mean square of NN (RMSNN) [ms]	N-F	34.2 ± 10.7	37.3 ± 11.5	36.0 ± 10.4	36.1 ± 11.2	32.8 ± 8.4	30.3 ± 7.4
	F	27.0 ± 13.6	29.7 ± 13.6	29.1 ± 12.9	27.3 ± 12.4	28.0 ± 13.4	27.3 ± 12.1
Low frequency power x1000 (LF) [ms2]	N-F	1.13 ± 0.24	1.25 ± 0.38	1.19 ± 0.23	1.12 ± 0.19	1.09 ± 0.23	0.98 ± 0.07
	F	0.76 ± 0.29	0.79 ± 0.24	0.85 ± 0.34	0.73 ± 0.20	0.75 ± 0.27	0.91 ± 0.43
High frequency power x1000 (HF) [ms2]	N-F	0.88 ± 0.27	0.97 ± 0.20	0.93 ± 0.30	0.96 ± 0.33	0.80 ± 0.21	0.84 ± 0.28
	F	0.68 ± 0.42	0.73 ± 0.40	0.64 ± 0.26	0.59 ± 0.21	0.61 ± 0.24	0.60 ± 0.21
Ratio of LF to HF [\sim]	N-F	1.44 ± 0.34	1.36 ± 0.26	1.37 ± 0.36	1.36 ± 0.40	1.35 ± 0.41	1.33 ± 0.40
	F	1.40 ± 0.52	1.36 ± 0.58	1.15 ± 0.41	1.30 ± 0.49	1.18 ± 0.33	1.27 ± 0.42
Breathing rate (BR) [bpm]	N-F	18.2 ± 2.7	17.1 ± 2.6	17.5 ± 2.4	17.7 ± 3.6	16.7 ± 1.0	16.8 ± 2.0
	F	17.6 ± 3.1	17.3 ± 2.9	16.9 ± 3.1	17.2 ± 2.2	17.8 ± 2.9	16.6 ± 2.0
Standard deviation of breathing (SDBR) [\sim]	N-F	0.82 ± 0.42	0.90 ± 0.38	0.86 ± 0.33	0.92 ± 0.41	0.87 ± 0.31	0.68 ± 0.25
	F	1.43 ± 0.98	0.97 ± 0.38	0.84 ± 0.26	0.86 ± 0.34	1.08 ± 0.77	1.03 ± 0.73
Median of depths of breaths (MDB) [\sim]	N-F	0.92 ± 0.38	0.88 ± 0.30	1.00 ± 0.44	0.99 ± 0.44	0.99 ± 0.45	0.94 ± 0.42
	F	1.13 ± 0.77	1.10 ± 0.71	1.03 ± 0.63	1.04 ± 0.73	1.02 ± 0.71	0.96 ± 0.70

Table 11: Motion features of the participants clustered using km2 method

Feature description	Group	Part1		Part2		Part3	
		Beg.	End.	Beg.	End.	Beg.	End.
Perc. of concurrent time (CT)[%]	N-F	45.1 ± 5.2	38.1 ± 9.6	18.0 ± 9.7	14.6 ± 9.9	19.7 ± 9.8	15.2 ± 10.7
	F	49.3 ± 3.8	46.6 ± 3.2	30.0 ± 5.8	31.9 ± 6.1	43.0 ± 12.6	45.0 ± 7.3
Screwing time per screw (ST) [s]	N-F	4.71 ± 0.36	4.69 ± 0.41	4.77 ± 0.46	4.58 ± 0.26	4.69 ± 0.17	4.54 ± 0.26
	F	4.45 ± 0.28	4.33 ± 0.13	4.35 ± 0.29	4.42 ± 0.37	4.38 ± 0.27	4.39 ± 0.29
Bad contact time (BT)[s]	N-F	0.40 ± 0.16	0.40 ± 0.25	0.42 ± 0.20	0.35 ± 0.24	0.27 ± 0.18	0.37 ± 0.38
	F	0.43 ± 0.16	0.60 ± 0.33	0.61 ± 0.24	0.55 ± 0.29	0.49 ± 0.32	0.45 ± 0.23
Number of mistakes per screw (M)[~]	N-F	0.01 ± 0.02	0.06 ± 0.08	0.13 ± 0.11	0.06 ± 0.06	0.13 ± 0.11	0.01 ± 0.02
	F	0.01 ± 0.03	0.06 ± 0.08	0.16 ± 0.16	0.14 ± 0.14	0.26 ± 0.17	0.17 ± 0.16
Dist. from the plate at the drop time (DP)[m]	N-F	0.26 ± 0.04	0.25 ± 0.05	0.29 ± 0.04	0.28 ± 0.04	0.26 ± 0.04	0.28 ± 0.02
	F	0.25 ± 0.03	0.22 ± 0.04	0.25 ± 0.05	0.26 ± 0.02	0.19 ± 0.02	0.23 ± 0.03
Max velocity of the right hand (MV)[m/s]	N-F	0.52 ± 0.13	0.48 ± 0.13	0.59 ± 0.10	0.55 ± 0.25	0.43 ± 0.15	0.42 ± 0.23
	F	0.48 ± 0.12	0.47 ± 0.13	0.56 ± 0.10	0.57 ± 0.19	0.41 ± 0.14	0.39 ± 0.08
Max acc. of the right hand (MA)[m/s ²]	N-F	3.12 ± 0.80	3.14 ± 0.94	4.08 ± 0.91	3.37 ± 1.54	2.72 ± 1.02	2.77 ± 1.54
	F	2.84 ± 0.73	3.13 ± 1.10	3.86 ± 0.94	4.20 ± 1.43	2.98 ± 1.12	2.81 ± 0.91

Table 12: Physiological features of the participants clustered using km2 method

Feature description	Group	Part1			Part2			Part3		
		Beg.	End.	Beg.	End.	Beg.	End.	Beg.	End.	Beg.
Heart rate (HR) [bpm]	N-F	81.2 ± 2.5	79.8 ± 4.2	79.1 ± 3.7	81.3 ± 5.5	79.4 ± 3.4	81.6 ± 5.8			
	F	79.1 ± 9.2	80.5 ± 12.0	78.1 ± 8.9	78.3 ± 9.2	78.7 ± 9.4	79.7 ± 9.8			
Standard deviation of NN (SDNN) [ms]	N-F	51.0 ± 8.4	57.5 ± 16.1	56.8 ± 13.6	59.9 ± 18.1	56.0 ± 7.1	51.3 ± 12.4			
	F	45.2 ± 8.1	47.4 ± 15.5	45.7 ± 14.1	46.0 ± 15.2	42.2 ± 12.6	41.1 ± 12.3			
Root mean square of NN (RMSNN) [ms]	N-F	32.3 ± 11.1	35.1 ± 12.4	33.9 ± 11.2	34.3 ± 12.2	31.1 ± 9.7	28.8 ± 8.6			
	F	28.7 ± 12.0	30.5 ± 11.5	29.5 ± 11.1	29.2 ± 11.5	28.5 ± 11.5	27.2 ± 10.0			
Low frequency power x1000 (LF) [ms2]	N-F	1.08 ± 0.25	1.10 ± 0.29	1.15 ± 0.24	1.08 ± 0.23	1.06 ± 0.25	0.97 ± 0.07			
	F	0.78 ± 0.24	0.80 ± 0.20	0.87 ± 0.32	0.80 ± 0.23	0.73 ± 0.22	0.89 ± 0.38			
High frequency power x1000 (HF) [ms2]	N-F	0.83 ± 0.28	0.90 ± 0.32	0.88 ± 0.31	0.91 ± 0.35	0.81 ± 0.30	0.78 ± 0.30			
	F	0.72 ± 0.37	0.78 ± 0.34	0.75 ± 0.35	0.67 ± 0.27	0.66 ± 0.24	0.63 ± 0.19			
Ratio of LF to HF [\sim]	N-F	1.46 ± 0.32	1.38 ± 0.28	1.42 ± 0.40	1.39 ± 0.42	1.43 ± 0.46	1.38 ± 0.44			
	F	1.09 ± 0.29	1.12 ± 0.42	1.07 ± 0.38	1.09 ± 0.36	1.02 ± 0.25	1.18 ± 0.42			
Breathing rate (BR) [bpm]	N-F	18.2 ± 2.6	17.2 ± 2.5	17.6 ± 2.3	17.0 ± 4.2	17.4 ± 1.9	16.8 ± 1.9			
	F	17.1 ± 3.5	16.9 ± 3.1	16.7 ± 3.0	17.0 ± 2.4	17.5 ± 3.0	16.6 ± 2.6			
Standard deviation of breathing (SDBR) [\sim]	N-F	0.83 ± 0.50	0.92 ± 0.49	0.80 ± 0.37	0.95 ± 0.52	0.80 ± 0.37	0.74 ± 0.40			
	F	1.01 ± 0.37	1.02 ± 0.38	0.99 ± 0.54	0.87 ± 0.33	0.84 ± 0.36	0.84 ± 0.35			
Median of depths of breaths (MDB) [\sim]	N-F	0.90 ± 0.44	0.89 ± 0.44	1.02 ± 0.55	0.98 ± 0.50	0.96 ± 0.50	0.91 ± 0.46			
	F	1.16 ± 0.72	1.13 ± 0.63	1.08 ± 0.58	1.03 ± 0.62	1.04 ± 0.63	0.99 ± 0.62			

Table 13: Motion features of the participants clustered using som3 method

Feature description	Group	Part1		Part2		Part3	
		Beg.	End.	Beg.	End.	Beg.	End.
Perc. of concurrent time (CT)[%]	N-F	45.4 ± 5.3	38.5 ± 9.7	22.0 ± 4.8	12.8 ± 9.7	18.1 ± 10.0	12.4 ± 9.1
	F	52.5 ± 7.5	49.8 ± 4.3	37.9 ± 11.0	45.4 ± 10.5	59.1 ± 7.1	56.7 ± 8.8
Screwing time per screw (ST) [s]	N-F	4.71 ± 0.38	4.70 ± 0.43	4.80 ± 0.49	4.67 ± 0.43	4.68 ± 0.18	4.53 ± 0.28
	F	4.30 ± 0.09	4.33 ± 0.09	4.24 ± 0.17	4.10 ± 0.05	4.32 ± 0.18	4.33 ± 0.23
Bad contact time (BT)[s]	N-F	0.42 ± 0.16	0.41 ± 0.26	0.45 ± 0.21	0.38 ± 0.26	0.36 ± 0.31	0.42 ± 0.39
	F	0.57 ± 0.29	0.60 ± 0.31	0.57 ± 0.16	0.46 ± 0.15	0.57 ± 0.15	0.42 ± 0.07
Number of mistakes per screw (M)[~]	N-F	0.00 ± 0.00	0.07 ± 0.08	0.14 ± 0.12	0.07 ± 0.06	0.10 ± 0.09	0.00 ± 0.00
	F	0.00 ± 0.00	0.07 ± 0.07	0.25 ± 0.21	0.15 ± 0.04	0.30 ± 0.04	0.18 ± 0.12
Dist. from the plate at the drop time (DP)[m]	N-F	0.25 ± 0.03	0.24 ± 0.03	0.28 ± 0.03	0.28 ± 0.03	0.24 ± 0.03	0.28 ± 0.02
	F	0.24 ± 0.04	0.20 ± 0.01	0.23 ± 0.03	0.22 ± 0.04	0.17 ± 0.00	0.20 ± 0.01
Max velocity of the right hand (MV)[m/s]	N-F	0.47 ± 0.08	0.46 ± 0.12	0.55 ± 0.06	0.48 ± 0.20	0.39 ± 0.13	0.38 ± 0.21
	F	0.48 ± 0.12	0.48 ± 0.16	0.57 ± 0.16	0.52 ± 0.26	0.30 ± 0.10	0.36 ± 0.11
Max acc. of the right hand (MA)[m/s ²]	N-F	2.97 ± 0.77	2.98 ± 0.93	3.58 ± 0.43	3.02 ± 1.40	2.47 ± 0.95	2.03 ± 0.46
	F	2.77 ± 0.96	3.31 ± 1.36	4.59 ± 2.14	3.78 ± 2.03	2.31 ± 1.36	2.61 ± 1.13

Table 14: Physiological features of the participants clustered using som3 method

Feature description	Group	Part1		Part2		Part3	
		Beg.	End.	Beg.	End.	Beg.	End.
Heart rate (HR)[bpm]	N-F	81.5 ± 2.7	79.6 ± 4.6	78.4 ± 3.5	81.0 ± 6.0	79.2 ± 3.6	79.6 ± 8.6
	F	79.9 ± 19.9	78.4 ± 19.2	79.0 ± 18.8	79.0 ± 19.6	78.9 ± 19.1	78.7 ± 18.5
Standard deviation of NN (SDNN) [ms]	N-F	59.7 ± 14.9	60.6 ± 15.7	59.2 ± 13.0	63.2 ± 17.2	55.2 ± 6.9	53.8 ± 11.1
	F	40.6 ± 13.7	45.8 ± 7.1	42.4 ± 13.3	41.5 ± 13.1	42.2 ± 14.2	42.7 ± 10.6
Root mean square of NN (RMSNN) [ms]	N-F	34.2 ± 10.7	37.3 ± 11.5	36.0 ± 10.4	36.1 ± 11.2	32.8 ± 8.4	30.3 ± 7.4
	F	27.1 ± 13.9	30.8 ± 14.1	28.2 ± 12.0	26.8 ± 11.0	27.2 ± 11.3	27.4 ± 8.8
Low frequency power x1000 (LF) [ms2]	N-F	1.13 ± 0.24	1.25 ± 0.38	1.19 ± 0.23	1.12 ± 0.19	1.09 ± 0.23	0.98 ± 0.07
	F	0.78 ± 0.36	0.76 ± 0.23	0.75 ± 0.31	0.70 ± 0.22	0.72 ± 0.27	0.83 ± 0.35
High frequency power x1000 (HF) [ms2]	N-F	0.88 ± 0.27	0.97 ± 0.20	0.93 ± 0.30	0.96 ± 0.33	0.80 ± 0.21	0.84 ± 0.28
	F	0.63 ± 0.34	0.70 ± 0.33	0.67 ± 0.31	0.64 ± 0.25	0.65 ± 0.26	0.65 ± 0.18
Ratio of LF to HF [\sim]	N-F	1.44 ± 0.34	1.36 ± 0.26	1.37 ± 0.36	1.36 ± 0.40	1.35 ± 0.41	1.33 ± 0.40
	F	1.36 ± 0.54	1.25 ± 0.67	0.89 ± 0.10	1.20 ± 0.63	0.93 ± 0.14	1.36 ± 0.77
Breathing rate (BR) [bpm]	N-F	18.2 ± 2.7	17.1 ± 2.6	17.5 ± 2.4	17.7 ± 3.6	16.7 ± 1.0	16.8 ± 2.0
	F	16.7 ± 2.2	17.1 ± 2.6	16.1 ± 3.4	17.1 ± 1.1	18.7 ± 2.5	16.8 ± 1.9
Standard deviation of breathing (SDBR) [\sim]	N-F	0.82 ± 0.42	0.90 ± 0.38	0.86 ± 0.33	0.92 ± 0.41	0.87 ± 0.31	0.68 ± 0.25
	F	1.34 ± 1.17	0.68 ± 0.22	0.62 ± 0.09	0.59 ± 0.17	0.50 ± 0.20	0.55 ± 0.23
Median of depths of breaths (MDB) [\sim]	N-F	0.92 ± 0.38	0.88 ± 0.30	1.00 ± 0.44	0.99 ± 0.44	0.99 ± 0.45	0.94 ± 0.42
	F	0.60 ± 0.16	0.62 ± 0.18	0.60 ± 0.16	0.59 ± 0.14	0.58 ± 0.14	0.57 ± 0.15