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Course: **Human-Computer Interaction**

Topic: **Statistical data analysis in HCI research**

Resource: **A mock-up case (student assignment)**

The experiment examines the effect of the pointing device on the time of the trajectory tracing task. A test application was developed in which path tracking can be performed with the finger, the mouse, the stylus and the joystick.

Thirty participants took part in the experiment and completed a cycle of 10 unit tasks of varying complexity with each pointing device. The order of the devices in the test procedure was counterbalanced according to the principle of the 4x4 Latin square. The mean time of task execution in the cycle was used as a measure of efficiency. These mean values of task execution time for each individual participant are available in an Excel file (below).

It is necessary to perform a statistical analysis of the available data and draw appropriate conclusions in two different contexts:

- (1) Considering all pointing devices as separate interaction modalities;
- (2) averaging the values for direct manipulation (finger, stylus) and indirect manipulation (mouse, joystick) and comparing the efficiency only in relation to these two aspects.

#### DATA

CASE 08	Finger	Mouse	Stylus	Joystick
	Task completion times [means, in seconds]			
Participant 01	14.29	14.72	12.85	15.85
Participant 02	14.52	11.88	5.22	14.06
Participant 03	18.91	13.27	12.66	18.86
Participant 04	17.38	15.85	10	13.22

Participant 05	17.56	13.22	9.16	17.42
Participant 06	18.62	6.22	8.37	14.47
Participant 07	15.73	10.14	10.96	21.88
Participant 08	16.27	16.69	9.4	14.52
Participant 09	15.92	12.27	11.52	15.04
Participant 10	15.95	14.54	12.1	6.75
Participant 11	16.71	9.53	11.41	9.91
Participant 12	14.77	8.42	12.74	8.8
Participant 13	14.84	9.82	11.03	11.21
Participant 14	18.73	14.25	13.33	11.87
Participant 15	16.90	8.8	11.44	10.65
Participant 16	17.85	11.03	9.52	20.02
Participant 17	20.40	11.34	8.88	8.83
Participant 18	14.90	9.62	11.41	15.01
Participant 19	12.50	12.11	12.21	14.5
Participant 20	17.63	14.34	14.05	12.41
Participant 21	15.00	9.16	12.46	17.08
Participant 22	16.41	13.86	10	16.85
Participant 23	16.17	16.05	9.58	13.33
Participant 24	18.17	7.27	15.37	14.73
Participant 25	12.56	12.5	9.9	22.96
Participant 26	17.21	8.57	9.57	7.66
Participant 27	15.23	9.24	11.13	16.43
Participant 28	13.56	10.08	12	7.73
Participant 29	13.68	15.4	8.54	14.93
Participant 30	15.02	13.05	11.16	23.43