Social Robotics

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Classwork Sheet 2

Exercise 2.1 (Levels of Measurement)

Mark the correct statements about each level of measurement in the table.

	nominal	ordinal	interval
possible to count frequencies	☐	☐	☐
possible to calculate arithmetic mean	☐	☐	☐
median can be identified	☐	☐	☐
statements about bigger-smaller relations are possible	☐	☐	☐

Exercise 2.2 (Variables and Measurement)

(a) How do dependent and independent variables relate?

(b) Name two possibilities to measure...

    (a) ... the strenght of a robot soccer team.

    (b) ... the complexity of a route.

Exercise 2.3 (Quality Criteria)

(a) A questionnaire is supposed to measure the perceived aliveness of a robot. Instead it measures the human-likeliness of a robots behaviour. Which quality criteria is violated here?

(b) A questionnaire is supposed to measure the empathy of a participant. It turns out that if the same participant fills in the test at different time points it yields strongly varying results. Which quality criteria is violated?

Exercise 2.4 (Research Process)

Give an example for the stages of the research process (similar to the one on slide 7) for a possible study with the robot you've designed in your group. Start from an initial observation that could be interesting for the field of usage of the robot.

Exercise 2.5 (Measures of Central Tendency)

Consider the two datasets *Age* and *Gender*:

- *Age*: 21, 23, 20, 19, 27, 24, 21, 22, 22, 20, 25, 24, 26, 23, 22

- *Gender* (female=0; male=1): 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 0, 1

(a) Calculate statistics of central tendency (mean, median, mode) allowed for the given data.

(b) Calculate variance and standard deviation where applicable.

Exercise 2.6 (Boxplots)

Draw a Boxplot for the given data and calculate the IQR.

- 7, 6, 8, 7, 4, 6, 6, 8, 5, 2, 9, 8

Exercise 2.7 (z-Distribution)

Which of the following statements are wrong?

A z-transformed distribution has got...

☐ ... a median of 0

☐ ... a standard deviation of 1

☐ ... a variance of 1

☐ ... a mean of 0

☐ ... a mode of 1

Exercise 2.8 (z-Scores)

Two persons (participant A, participant B) have rated a robot using different sympathy tests. In the test completed by participant A, the robot receives a mean score of $\overline{X}_1 = 100$ with standard deviation $s_1 = 17$, and in the test completed by participant B, the robot receives a mean score of $\overline{X}_2 = 140$ with standard deviation $s_2 = 8$. For participant A the robot has reached a sympathy score of 115, for participant B a sympathy score of 150. Which participant has rated the robot better relatively?