

## Social Robotics

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## Classwork Sheet 6

### Exercise 6.1 (Basics of ANOVA)

- (a) Name all criteria to be fulfilled for using ANOVAs.
- (b) What is the disadvantage of running t-tests instead of an ANOVA?

### Exercise 6.2 (Correction)

Consider the following four null hypotheses and their respective p-values:

- (A)  $H_A : p = 0.040$  (Primary Hypothesis)
- (B)  $H_B : p = 0.029$
- (C)  $H_C : p = 0.015$
- (D)  $H_D : p = 0.008$

Use the following correction method to counteract the problem of multiple comparisons. Which hypotheses are accepted?

- (a) Bonferroni correction
- (b) Holm-Bonferroni method
- (c) Two-Step procedure (Frane Method)

### Exercise 6.3 (ANOVA: One Factor)

A small experiment investigated if the profession of a person has an influence on the fear of a robot apocalypse. Three different professions were compared: philosophers, roboticists, and industrial engineers. People were asked to rate their amount of fear on a scale between 1 and 15, with high values representing a high amount of fear. The results of this study can be seen in the table.

Groups			
Industrial Engineer	Philosopher	Roboticist	
4	9	12	
2	7	8	
4	7	8	
2	3	6	
$\bar{X}_1 =$	$\bar{X}_2 =$	$\bar{X}_3 =$	$\bar{X} =$

- (a) Define the statistical  $H_0$  and  $H_1$ .
- (b) Calculate the missing values for the table above.
- (c) Calculate the F-value.
- (d) Is the result significant on an  $\alpha$ -level of 5%? Interpret the result.