# Human arm trajectories in obstacle avoidance

Oskar Eiler Wiese Christensen s183917
Anders Henriksen s183904

02445 Project in Statistical Evaluation of Artificial Evaluation

January 14, 2020

## Abstract

*The summary should contain a summary of the problem that you are working with, which results you got, as well as main conclusions.*
*Don't get into technical details. The summary should not be very long*
In this paper, the goal is, using the `armdata.Rdata` dataset, to determine if people can be recognized based on their movements, and if obstacles change the movement curve of the hand of the subject in question.
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Gravida arcu ac tortor dignissim. Et netus et malesuada fames. Convallis posuere morbi leo urna molestie at elementum eu facilisis. Etiam erat velit scelerisque in dictum non. Mollis nunc sed id semper risus in hendrerit gravida. Cursus euismod quis viverra nibh cras pulvinar mattis nunc sed. Eu tincidunt tortor aliquam nulla. Duis convallis convallis tellus id interdum. Nunc lobortis mattis aliquam faucibus purus in massa tempor. Feugiat sed lectus vestibulum mattis ullamcorper. Malesuada proin libero nunc consequat interdum varius. Sed pulvinar proin gravida hendrerit lectus. Varius morbi enim nunc faucibus a. Ultricies leo integer malesuada nunc vel risus commodo viverra maecenas. Id aliquet lectus proin nibh nisl. Ullamcorper velit sed ullamcorper morbi tincidunt.

# 1 Introduction

*Briefly introduce the background and setting of the problem, as well as the aim of the report. Furthermore, you could give a very short description of the analysis that will be applied.*

Security plays a larger role in existence every year, whether used for personal security or for the governmental spying on billions. Throughout the years, sercurity has taken many forms like facial and voice recognition, but movement recognition, if it proves successful, could turn out to be an effective way of finding perpetrators of crimes or locking people into their own homes. For this to truly be effective, it should be possible to classify people based on their movements and maybe even recognize actions based on the motion curve.

This is exactly what is wished to be accomplished in this paper; Classify the person performing the action based on the given motion curve using decision trees and K-nearest neighbors, and analyzing whether the type of obstacle has an influence on the resulting curve by the use of t-tests and ANOVA. For this, the focus has been specifically on the arm movement dataset from **Grimme et al. 2014**. The hypothesis prior to the carrying out of the experiment was that it should be possible to classify the person based on the curve, since people can move in substantially different ways. It is also expected that experiment should play a significant role on the resulting curve, since a much taller obstacle should make people lift their arms much more dracstially.

# 2 Data

*Describe of the data you are analyzing. What kinds of data do you have, how were they collected (if applicable)?*
*Include a few good plots to highlight important features in data. You can put additional plots in the appendix.* In a matter of seconds, I the grand master of Time will begin to write something meaningful about our data.

# 3 Methods

*Describe the methods you used and why you decided to use them. Also discuss the assumptions behind the methods. Do not go into detail with theory.*

# 4 Results

*Present the results.*
*Tables and figures are good ways of illustrating results.*

# 5 Discussion

*What do your results show?*
*Discuss your results. How reliable are they?*

# 6 Conclusion

*What are your conclusions? The conclusion should be connected to the aim of the report in the introduction.*
*Highlight important results*
*If you have found interesting problems/aspects that you haven't carried out, you can specify them here as 'future work'.*

# 7 Appendix