

Eye Half/Full-blink Detection in Horse Videos for Welfare Applications

Contact: João Alves
jmal@create.aau.dk

1 Introduction

Several works have shown that blink rates in animals can be an indicator of different affective states, such as pain and stress, especially in equine species such as horses [1]. In this context, not only blink rates but also half-blink rates (defined as a partial lowering of the upper eyelid without full closure of the eye) can provide valuable insights into the animal’s affective state.

However, datasets that contain such annotations in video are scarce due to their high production cost. This is partly related to stables and horse upkeep, but also to the need to employ expert annotators for extended periods of time during the annotation process, particularly when dealing with subtle eye movements such as half-blinks. For this reason, it is important to develop pipelines that can effectively aid experts or automate the extraction of these facial actions from video data, which can then be leveraged into affective state assessment applications further down the line.

2 Project description

This project has two main goals:

- Develop an algorithm to detect horse eye blinks.
- Develop an algorithm capable of detecting and distinguishing between full and half blinks.

2.1 Challenges

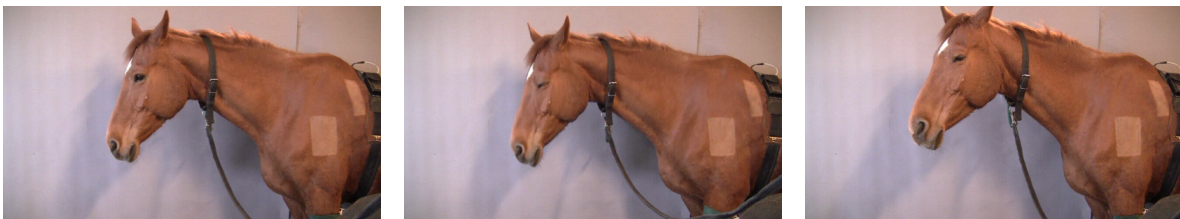
The main challenges related to this project are as follows:

- Can existing facial action detection works be applied to this domain? In what way?
- What limitations does the lack of available data impose?
- What approaches best ensure attaining the proposed goals?

2.2 Data

The dataset used for this work comes from the Rashid et. al [3] that made public data produced by Glerup et. al [2], where researchers annotated the presence of different facial movements, including full blink and half-blink, in horse videos.

Some dataset examples are given below.



(a) Eye open (no blink).

(b) Full blink.

(c) Half blink.

Figure 1: Dataset example: different horse eye blink movements.

References

- [1] Katrina Ask, Marie Rhodin, Maheen Rashid-Engström, Elin Hernlund, and Pia Haubro Andersen. Changes in the equine facial repertoire during different orthopedic pain intensities. 14(1):129.
- [2] Karina B Glerup, Björn Forkman, Casper Lindegaard, and Pia H Andersen. An equine pain face. 42(1):103–114.
- [3] Maheen Rashid, Alina Silventoinen, Karina Bech Glerup, and Pia Haubro Andersen. Equine facial action coding system for determination of pain-related facial responses in videos of horses. 15(11):e0231608.