Readme file of the data frame used for the study: Potential evidence for route choice through snow in the Svalbard rock ptarmigan.

This file intends to explain how to read the data used for the analysis of the paper. In particular, it will describe the meaning of the data indexed in each of the column, to researchers that may want to run their own analysis using this data set.

Data frame description:

|  |  |
| --- | --- |
| **Column** | **Description** |
| date | Date on which the data was recorded. |
| id | This corresponds to the individual bird ID. It was determined by the GPS tracking waypoint marking its geographic location. A male and a female might have the same ID number if they were found together at the same location. |
| sex | Ptarmigan sex. |
| leg length | The mean total leg length as a result of the sum of all leg segments taken from [1]. |
| body mass | The mean body mass taken from [1]. |
| video | This column provides the video file name from which kinematic measurements were taken. The rows with a value of “0” indicate that no videos were taken and the only kinematic data taken from footprints is stride length. |
| set/track | ID of the track left by individual ptarmigan. |
| snow-prop | Qualitative physical properties of snow based on observations in the field. |
| stride-number | Number of strides suitable for analysis. |
| source | This column refers to the method by which ptarmigan locomotion speed was taken. “measured” values mean that speed was directly measured from video recordings. “predicted” values mean that speed was estimated indirectly from the stride length measured from footprints using the equations in [2]. |
| speed | Speed in metres per second. |
| frequency | Stride frequency in number of strides per second. For tracks without a video recording, it was impossible to determine stride frequency, thus the rows were left in blank. |
| length | Stride length measured from footprints. |
| stance | Stance duration in seconds. For tracks without a video recording, it was impossible to determine stance duration, thus the rows were left in blank. |
| swing | Swing duration in seconds. For tracks without a video recording, it was impossible to determine swing duration, thus the rows were left in blank. |
| df | The proportional duration of stance compared to the total time of stride duration called duty factor. For tracks without a video recording, it was impossible to determine duty factor, thus the rows were left in blank. |
| gait | Gait at which animals move. For tracks with associated videos, gait where determined based on the duty factors for each track and following gait boundaries described by [3]. For tracks with no associated video recording, gaits are allocated depending on predicted speed following [3]. Speed predictions falling into the grounded running gait, however, are problematic [2] and were left in blank. |
| force-penetration | Readings obtained for all the tracks under analysis, using the method developed by [4] |
| depthmean | Mean footprint depth of each stride (i.e. mean taken from the first and the subsequent step that makes a stride) |
| angle | Mean footprint angle of each stride (i.e. mean taken from the first and the subsequent step that makes a stride) |

**References**

[1] Lees JJ, Nudds RL, Folkow LP, Stokkan KA & Codd JR. 2012 Understanding sex differences in the cost of terrestrial locomotion. *Proceedings of the Royal Society B: Biological Sciences* **279**, 826-832. (doi:10.1098/rspb.2011.1334).

[2] Marmol-Guijarro A, Nudds R, Folkow L & Codd J. 2020 Examining the accuracy of trackways for predicting gait selection and speed of locomotion. *Front. Zool.* **17**, 17. (doi:10.1186/s12983-020-00363-z).

[3] Marmol-Guijarro AC, Nudds RL, Marrin JC, Folkow LP & Codd JR. 2019 Terrestrial locomotion of the Svalbard rock ptarmigan: comparing field and laboratory treadmill studies. *Sci. Rep.* **9**, 11451. (doi:10.1038/s41598-019-47989-6).

[4] Borstad CP & McClung DM. 2011 Thin-blade penetration resistance and snow strength. *J. Glaciol.* **57**, 325-336. (doi:10.3189/002214311796405924).