# Introduction

* *Reviewer 1:* The authors state that some of the previous works in literature only specify dimensional representations of an affective space, rather than specific emotions. Unfortunately, by missing the validated connection of discrete emotions and dimensional representations (see for instance Russel [1]), the authors dismiss a significant body of work that could be highly useful to their research. As an example, this includes survey work such as Gunes et. al. [2] and more specific Karg et. al. [3]. Julian: I will check this references to see if they are doing something using specific emotions to be added in the related work

# Robot Appearance

* *Editor*: It is not clear, in how far the appearance of the robot may have had an impact on the results. This is the reason, why various researchers, e.g. used point-light-walkers for studies on emotional gait. It might have been better to also use such an approach, e.g. equip the robot with light markers in a dark room, to get rid of any possible questionable effect in that direction or to repeat the study with different robot designs and compare the results.
* *Editor:* It is not clear, in how far the results do generalize to different robot embodiments.
* *Reviewer 2:* Generalizability is questionable, because emotions were deducted from the Likert-Scale indicated by the subjects for each treatment, however, this cannot be transferred to other robotic platforms with different specifications. So, this is a nice approach to optimize one product (robotic platform) with regard to its emotional expressiveness, so transferability to other robotic platforms is not clear. Julian: I think that this is connected with the other comments. But just doing with lights is not going to give any relevant information because people can still create an imaginary representation of the object. I think that an experiment comparing different embodiments is required (This could be a conclusion).
* *Reviewer 1:* The look of the system is very simplistic, which is apparently one of the design goals of the authors. However, people judge the emotional competence of systems by their appearance. For further studies, the authors should check if participants are attributing any emotional capabilities at all to the system.
* *Reviewer 2:* As indicated above, it would help to repeat the study using the same treatments on different robotic platforms with different geometry to see if the perception of the corresponding emotions depends on the (non-anthropomorphic) robot design. Julian: I would answer saying that at the moment we haven’t found any article tackling this and it is something that we want to do in the future. Also this we should mentions as further work. What do you think?

# System

* *Editor:* It is not clear, to what extend the commanded trajectories are executed by the robot. A simple PID-controller will produce significant tracking errors if no acceleration command and/or computed torque approach is implemented. This may have a significant impact on the results.
* *Reviewer 1:* It is unclear how the authors can guarantee a correct velocity of the robot with the described PID controller. Is there external feedback from a tracking system or does the system rely on internal encoders / odometry? Is the feedback coming from an IMU or is it based on wheel turns? If so, how can the authors guarantee that no slippage occurs?
* *Reviewer 2:* It is not clear how the movements of the robot are modeled (velocity and set point). Is there an underlying model or is it just heuristically assigned?

Julian: Do we should include information about all the calculations done to ensure this?

* *Reviewer 2:* Where do the selected values for the independent variables come from? How were they set? I understood that all possible treatments that could add a value to the experiment are generated heuristically, in total 195. Julian: a better explanation should be added. Explaining how was our process: selecting variables that we considered as relevant and from our previous studies (Cite to our other paper)

# Design

* *Editor:* It is not clear, why a categorical emotion representation is used. The tested variables are dimensional, so a dimensional emotion representation might lead to more general conclusions towards the impact of those variables on perceived emotions. The problem with categorical approaches vs. dimensional approaches for evaluation purposes is also pointed out in Bittermann, A. et al., "On the evaluation of emotion expressing robots", ICRA 2007.
* *Editor:* It would have helped, if social presence was evaluated during the study. Julian: yes it could help to see if our platform have a social impact, which could be interesting to test. This could be a nice work for a master thesis.
* *Reviewer 2:* In the introduction, the authors refer to the term of “social presence”. However, in the experiment, this topic is omitted as there is no corresponding item included in the questionnaire. The study would highly benefit from including constructs for user acceptance/user experience, e.g. the construct of social presence. Evaluated measures can be found in the UTAUT-Model (Heerink et al.) and the Godspeed questionnaires (Bartneck: <http://www.bartneck.de/2008/03/11/the-godspeed-questionnaire-series>) Julian: This is true that we mentioned that in the introduction, but I think that studying the emotional presence of the robot is not only influenced by the emotions but also by the embodiment. Therefore an study on the impact of the robot without expressing emotions should be done.
* *Reviewer 1:* One variable of the experiments was orientation. From the provided pictures a front orientation is not immediately clear. Did the authors instruct participants where the front is and were participants aware of this during the trials? Julian: yes, participants were instructed, this is missing in the article.
* *Reviewer 1*: The authors should explain more clearly why the experiment was limited to just 4 of the 6 basic emotions.

*Reviewer 2:* It would be interesting to know, why the four tested emotions were selected among the basic emotions as identified by Ekman

Julian: The list of basic emotions depend on the theorist who create them. The most popular list is the one created by Ekman, which embraces disgust, happiness, anger, sadness, fear and surprise. Others, such as Tomkins who list interest, enjoyment, surprise, fear, distress, anger, disgust, dissmell, and shame. Izards in “*Basic Emotions, Natural Kinds, Emotion Schemas, and a New Paradigm*” suggest the following basic emotions interest, happiness, sadness, anger, disgust, and fear. The intersection of these emotions reduced all of them to a set of five. From these five emotions were selected the ones that could then become in emotion schemas (Citation again to Izard). This is just a draft, but I think that this justifies better. What I don’t know if we have to introduce a section explaining this approaches.

# Results

* *Editor:* The results are not embedded in a comparable context with other works.
* *Editor:* It would strengthen the paper, if guidelines were condensed in a separate section.
* *Reviewer 1:* How do the findings from the experiment compare to other results in literature? What are common findings, what is maybe contradictory? Julian: I am not sure if we can compare, as we mentioned in our other article (The journal), it is not possible to make the comparison because there is not a framework that allows this comparison. Should be explain this?

# Conclusions

* *Reviewer 1:* A stated aim of the authors was to provide precise guidelines, a feature to distinguish this work from previous work in literature. However, the results and conclusion fail to provide clear guidelines on how to create specific emotions. Julian: I think that we are missing to point out the main findings that come from the results here or as the editor suggest to have a different section. What do you think?
* *Reviewer 1:* This and the isolated treatment of the results without embedding them in a more general context makes the overall scientific contribution of the submission questionable.

# General comments

* *Reviewer 2*: The paper should be proof read by a native speaker. Especially in Section 1, grammatical issues should be revised

# Additional Readings

* Bittermann, A. et al., "On the evaluation of emotion expressing robots", ICRA 2007.
* [1] J. A. Russell, "A Circumplex Model of Affect," J. Pers. Soc. Psychol., vol. 39, no. 6, pp. 1161-1178, 1980.
* [2] H. Gunes, B. Schuller, and M. Pantic, "Emotion representation, analysis and synthesis in continuous space: A survey," in Proceedings of the Automatic Face & Gesture Recognition and Workshops (FG 2011), 2011, pp. 827-834.
* [3] M. Karg et al., "Towards mapping emotive gait patterns from human to robot," in Proc. IEEE RO-MAN, 2010, pp. 258-263.
* With regard to robotic studies on emotions in gait, the highly related research of Michelle

Karg et al. should be reviewed and cited.