

## Challenge 38: Mouse MApp

**Q. Will the sponsors be able to provide data (e.g. annotated/labelled images and scores) for MGS and BCS that can be used when developing this prototype?**

**A.** Yes, we plan to help with a continuous flow of images and scores once the project has started and there is an agreement on what is requested for the development of the prototype.

**Q. How many annotated images/ data will be available from the Sponsors? Will this be from multiple strains/ types of mouse (e.g. with different fur and eye colour)?**

**A.** We hope to help with as many as needed and we are aware that there may be many to achieve a good machine learning system to work satisfactory. We assume that we need to focus on the most common strains first and hopefully later it can be evaluated how the prototype fits with more uncommon strains.

**Q. When will the datasets become available to work with?**

**A.** We would like to have the discussion with the applicant so that they can specify what they need first.

**Q. Will mice be socially/group housed?**

**A.** Mice are in general group housed.

**Q. If you have several animals in the same cage, is it expected that the mice will all be chipped to identify individual animals, or ear-clipped?**

**A.** Mice in study are individually marked on the tail with pen marker or tattoo, ear-clipped or chipped.

**Q. Why is the approach a tablet or smart phone-based app and not a low-cost permanent fixture? Would you also consider this type of approach?**

**A.** We are looking for something that can easily be moved between animal units. It should be easily cleaned and moved out of an animal room when the room is cleaned.

**Q. Should the app be independent from any specific commercially available hardware (e.g. an app that can be installed and used on a smart phone)?**

**A.** It would be good if it was compatible with any smart phone or tablet or other computing infrastructure (e.g. laptop).

**Q. Would you be open to having removable or novel sensors within the cage?**

**A.** We are open to it but there are many cages in an animal facility and for cost reasons it would be very expensive to have sensors for all mice in a facility.

**Q. Is it envisaged that the application is used to assess and score still images or continuous video images?**

A. It could be either one or both.

**Q. Would a solution that allows you to '(re)-train' a neural network in order to improve this network be acceptable?**

A. Yes, this approach is welcomed.

**Q. What is considered to be reasonably priced?**

A. It is difficult to say, but a product that can both improve animal welfare and save time (and money) would be very valuable. It would also depend on how the developers would like to manage the application (e.g. through individual licences, organisation licences, annual update fees etc).

**Q. A benefit of automated videos is to be able to operate during the night, a period largely underused and much more likely to be useful as activity is higher and changes potentially more marked. Do you consider night recordings as a must in your expectations?**

A. We do not consider it as a must. In fact, we are monitoring the animals over the day and if needed with extra surveillance at later time points and at night. If it is possible, it could be of valuable.

**Q. Do you have specifications regarding the environment in which the animals will be monitored? In the existing MGS literature, the mice were usually placed in specific boxes to perform scoring. Is this the desired setting or do you want a solution which works in different, more complex environments?**

A. We imagine that this system would be used without specific expectations regarding the environment, that animals can be "scored" in their home cage, on the grid of their home cage, when sitting in the palm of the hand or in a tube.

**Q. Would cloud based solutions be something that might be feasible with the use cases you have in mind?**

A. Yes, as long as there is appropriate security of the images/scores.

**Q. Are you focussed solely on facial expression of pain, or would you be interested in an app that can include other pain indicators as well?**

A. The body condition scoring is an alternative/additional scoring that could be used as well.

**Q. What kind of background experience would you be looking for?**

A. We are experts in mice and animal welfare but we require facial recognition, machine learning and artificial intelligence expertise together with data storage, data security, application specialist (although some of this may be available within the sponsor organisations).

**Q. I have expertise in certain areas, but not in all areas that are required to solve the Challenge. How can I find other expertise?**

**A.** Speak to the NC3Rs office ([crackitenquiries@nc3rs.org.uk](mailto:crackitenquiries@nc3rs.org.uk)) and we will do our best to help connect you with the expertise you are seeking. You can also make use of the Challenge-specific LinkedIn pages that have been established.

**Q. Who should we email with questions?**

**A.** General questions can be sent to the NC3Rs. Questions regarding a specific Challenge can be sent to the Sponsors, but enquiries should be sent to ALL Sponsor parties for a Challenge. If preferred, please email the NC3Rs to introduce you to the Sponsors at [crackitenquiries@nc3rs.org.uk](mailto:crackitenquiries@nc3rs.org.uk)