DEBRIEFING LETTER

Adaptive System Laboratory

Department of Electrical and Computer Engineering, University of Waterloo

Project Title:
Investigation of user's level of interest while interacting with the Sentient Canopy interactive art sculpture

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We appreciate your participation in our study, and thank you for spending the time helping us with our research!

In this study, you interacted with the *Sentient Canopy* interactive art sculpture and were asked to provide feedback on your interest level as you interacted with the sculpture, and on your overall experience after the session.

Two interactive behaviours were actually run on the sculpture during your visit. One was a pre-programmed version in which the automatic actuation and responses to sensory inputs were fixed. The other set of behaviours was based on a Curiosity-Based Learning Algorithm (CBLA), in which parameters that dictate the behaviours are generated automatically and change as the sculpture learns about itself and you. In the CBLA version, the sculpture will continuously learn to model the mapping between its inputs and outputs and select actions that will lead to greater learning. For example, it will attempt to learn if moving the Tentacle up and down will affect readings from the sensors. This is analogous to how animals and human beings learn. In this study, we hope to determine whether the behaviours generated through this method can make the experience of interacting with the sculptures more interesting. Simply put, we would like to know if behaviours generated using the CBLA are more interesting than those designed by human experts. The results of this study can enable designers to design more engaging and interesting art sculptures.

We hypothesized that the viewers will enjoy behaviours that are less predictable and changing. It is expected that since the CBLA continuously generates new interactive behaviours, viewers will find it more engaging and interesting. On the other hand, although the CBLA continuously generates new

behaviours, it is not random. It tends to exhibit new behaviours that promote predictable response from the viewers and the environment. We think that the viewer will be able to recognize that its behaviours are not random. In addition, we hypothesized that certain sets of parameters may generate more interesting behaviours and this can be a systematic way to discover those behaviours. The results from this study will provide us with evidence allowing us to accept or reject these hypotheses.

We could not give you complete information about the study before your involvement because it may have influenced your perception during the study in a way that would make investigations of the research question invalid. Specifically, we did not tell you that there were two versions of the behaviours and what the expected behaviours of the sculpture are because we wanted to avoid the *subject-expectancy effect*. This is a form of bias in which the test subject expects a particular result and this unconsciously affects the outcome. We hope that you understand the need for this partial disclosure now that the purpose of the study has been more fully explained to you.

All information you provided is considered completely confidential; indeed, your name will not be included or in any other way associated, with the data collected in the study. Furthermore, because the interest of this study is in the average responses of the entire group of participants, you will not be identified individually in any way in any written reports of this research. Paper records of data collected during this study will be destroyed after they have been digitalized. The converted electronic data will be kept for 20 years on a secure computer, to which only researchers associated with the Adaptive Systems Laboratory have access. This data may be additionally used for subsequent secondary data analysis comparing user responses to various interaction strategies, however, your name and identity will not be obtainable from the stored data.

This project has been reviewed by, and received ethics clearance through a University of Waterloo Research Ethics Committee. In the event you have any comments or concerns resulting from your participation in this study, please contact Dr. Maureen Nummelin, the Director, Office of Research Ethics, at 1-519-888-4567, Ext. 36005 or maureen.nummelin@uwaterloo.ca.

Because the study involves some aspects that you were not told about before starting, it is very important that you not discuss your experiences with anyone who potentially could be in this study. If people come into the study knowing about our specific predictions, as you can imagine, it could influence the results, and the data we collect would be not be useable. Also, since you will be given a copy of this feedback letter to take home with you, please do not make this available to others.

If you think of some other questions regarding this study, please do not hesitate to contact Matthew T.K. Chan at matthew.chan@uwaterloo.ca.

We really appreciate your participation, and hope that this has been an interesting experience for you.

References (related studies that may be of interest to you):

P.-Y. Oudeyer, F. Kaplan and V. V. Hafner, "Intrinsic Motivation Systems for Autonomous Mental Development," *IEEE Transactions on Evoluntionary Computation,* vol. 11, no. 2, pp. 265-286, 2007.