# Task-oriented User Analysis of 3D Animation Applications

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This research intends to study behavioral differences associated with different 3D animation applications (i.e., Discreet 3D Studio Max and Alias Maya). By completing a particular 3D animation task (i.e., bouncing ball) through diverse menu access, this study investigated multiple correlations between the uses of certain menu types of two applications; determining whether certain menu types could be grouped together for potential user interface guideline.

Due to the complexity and diverse scope of today's 3D animation applications, users are continually challenged how to maximize the usability of software interface that best fits their specific 3D animation tasks. Earlier studies have reported widespread inefficient use of complex computer systems such as CAD that typically offer more than one way to perform a given task [Bhavnani 1999]. The study developed a strategic behavior model using GOMS (goals, operators, methods and selection) [Card 1983]. Compared to CAD task that mainly focus on evaluating user comprehension, the animation tasks for film and video games are designed to deliver an affective human characteristics (i.e. emotion) as well as an objective characteristics (i.e., task completion). Even though there have been a large number of interface design guidelines have been developed that can increase effectiveness, efficiency, comfort and safety [Lui 1997], the investigation of affective processing in interface system design has been recently introduced [Kim 2003].

Based on think-aloud protocol method, the task was performed at the Cineme: International Animation Film Festival 2003, located at DePaul University in Chicago, Illinois. The tasks were performed on two identical laptops. One laptop had Alias Maya 5 installed and the other had 3DS Max 5 installed. Two camcorders were used to record both video and audio data of each participant performing the task. Sixteen participants' were tested by asking them to create a realistic bouncing ball animation (see Figure 1.) in either Maya (8 subjects) or Max (8 subjects). The basic purpose of the test was to investigate whether there were significant differences in how those two packages were used. The task, bouncing ball, was selected to incorporate many different types of interface interaction in both of the software packages. They were first asked to fill out a demographic questionnaire asking for information about gender, age, location, level of education, college or university attended level of 3D training, and software preference. They were then instructed to perform the task. The participants were also provided a sample animation to view before they began the task. When the participants finished performing the task to their satisfaction, they were asked to fill out a follow-up questionnaire regarding their preferences about interface elements within the software that they used. Also, the study recorded each participant's steps to collect frequent use of different menus such as keyframing, hotkey, graph editor, and R.T.S. (rotation, translation and scaling).

The multiple correlation analysis in Figure 2 shows whether or not various types of menus correlate to one another during the completion of the bouncing ball task. By comparing the frequency of menu interactions by pairs, the scatterplot matrix shows the correlation fraction between the various. For example, a pair of RTS and keyframing in Maya, the value of coefficient of correlation is 0.614 under df (degree of freedom) = 8, and calculated chi-square is 28.29 (.01 level) to show strong interactive relationship between two menus.

Even though this study had limitations such as small number of sample size, variation of task completion time and user experience, the result presented a potential for further studies including user testing for 3D modeling, or texturing. Besides investigating correlation, users' sequential behavior could be analyzed for association between menus.

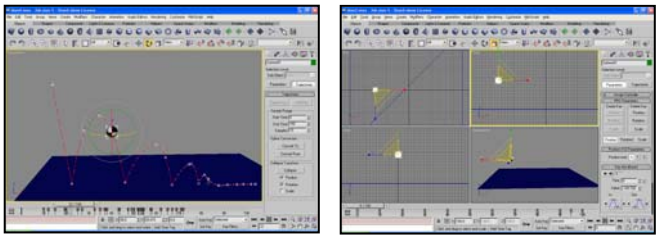

**Figure 1. Screen shot of bouncing ball task. (A) Maya, (B) 3D Studio Max**

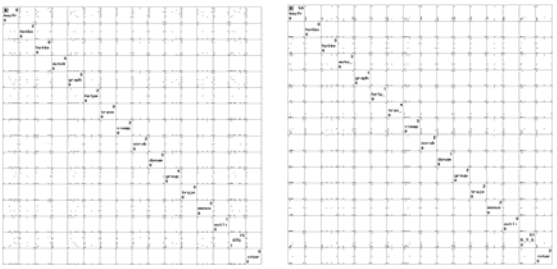

**Figure 2. Pairwise correlation data plot. (A) Maya, (B) 3D Studio Max**

## References

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