SCRIPT FOR DAYLIGHTING IN OPEN PLAN OFFICE SETTING

Thank you for volunteering to participate in today's user study. We are studying the effectiveness of our new physical daylighting simulation tool for architectural design and analysis. We call this tool the virtual heliodon.

Today you will be asked to perform a few design exercises using our virtual heliodon setup.

Let's go across the hall and I'll show you the space which you will be asked to first analyze in its current form, and then redesign.

WALK FROM CONTRAPTION ROOM INTO 331

For today's user study you will be asked to complete a few short daylighting analysis and design exercises related to this student office space using the virtual heliodon. Here is an overview of the exercises. After each exercise you will answer a few short written questions.

HAND USER EXERCISE SHEET

This office area is for computer science graduate students studying computer graphics and computer vision. As you can see, this room is arranged for about a dozen students working at laptop or desktop computers with standard LCD monitors. Typical working hours for students in the lab are from 10am-6pm, but it tends to be more busy in the afternoons. As you can see the room contains a single window, which faces almost due south. The dimensions of the room are roughly 25 feet by 32 feet. The ceiling is roughly 11 feet above the floor and the window is 4 feet wide by 8 feet tall.

Briefly, your tasks for today's study are as follows.

1. **First, you will analyze the available daylighting in the current room design.** You will be asked to identify areas in the room that have too much or too little daylighting, and to identify areas and times when glare from the sun might be problematic for students sitting at the desks trying to do computer work.

   You will do this analysis first from your intuition alone, and second by using the virtual heliodon.

2. **Next, you will suggest renovations to the room to improve the use of daylighting.** You will make these edits to the design using the virtual heliodon and re-analyze the available daylighting in the new space.

3. **Third, you will create and analyze a completely new design for the same program.** Your new design should provide working space for 12 students with roughly the same square footage, but it can be located in a different building on campus, have a different orientation with respect to the sun, etc. You will again use the virtual heliodon to sketch and analyze your new design.

Now I will give you a chance to explore this room, make notes about the existing room geometry and materials, and ask questions. Do you have any questions about the existing space or how we are using the room?

PAUSE TO LET THE USER EXPLORE THE ROOM AND ANSWER ANY QUESTIONS

Please fill out Part 1 of the questionnaire.

PAUSE FOR USER TO FILL OUT QUESTIONNAIRE – APPROX. 5 MINUTES

Ok, now we will return to the other room.

RETURN TO CONTRAPTION ROOM

Next, we would like you to build a model of the existing room geometry using the virtual heliodon system.

There are three types of geometry elements you will be using today: flat walls, curved walls, and window markers. The approximate scale of these components is 1 inch = 1 foot. The cyan markers are for tall windows, the yellow markers are for short windows.

To construct a design, you may place elements on the table surface. Please make sure to keep the elements within the pencil circle, so that the overhead camera can distinguish each element. Note that walls need not touch to indicate a connection. These gaps will be automatically detected and the system will build a closed model of the geometry for simulation.

There are 2 types of tiles you will place on the table surface. The first is the "north arrow", which indicates the overall orientation of the building on the site. The second type of tile indicates the materials within the design. The small paint chip in the center of the tile indicates the color of the material. A tile with a green border indicates the floor material. A tile with a blue border indicates the wall material. Please place these tokens sufficiently far away from the walls of the design so that the overhead camera has a clear view of each token.

Now let's get started. Please create a scale model of the geometry and materials of the office space we are analyzing today.

PAUSE FOR USER TO BUILD THE DESIGN. PROMPT THE USER TO ADD THE WINDOW, NORTH ARROW, AND MATERIALS IF THEY HAVE OMITTED ANY COMPONENT.

Now we are ready to do analysis. You can request from me a simulation of the daylighting for any time of day for any day of the year for a clear sunny sky. Please tell me the month, day, and time of day you would like to see.

PRESENT THE REQUESTED SIMULATION TIME/DAY

You may also request a time-lapse animation for a single day. Please tell me the month, day, and the start and end times for the animation.

PRESENT THE REQUESTED TIME-LAPSE ANIMATION

Please continue with your analysis of the daylighting within this design. Just let me know what times and dates you would like me to show you.

PERFORM THE REQUESTED SIMULATIONS. PROMPT THE USER TO PERFORM SEVERAL SIMULATIONS. – APPROX 5-10 MINUTES TOTAL ANALYSIS TIME

Please fill out Part 2 of the questionnaire.

PAUSE FOR USER TO FILL OUT QUESTIONNAIRE – APPROX. 5 MINUTES

Next, we would like you to suggest some renovations to the existing space that will improve the use of daylighting within the design. Make the appropriate modifications to the geometry and materials of the design. Let me know when you are finished.

PAUSE FOR USER TO BUILD A NEW DESIGN. IF THE USER TRIES TO CHANGE THE NORTH ARROW, OR MAKE MAJOR CHANGES TO THE DESIGN, REMIND THEM THAT THIS SHOULD BE A RENOVATION OF AN EXISTING SPACE.

Now we are ready to do the daylighting analysis of the design. Again, please request any single time/day simulations you would like to view or time-lapse animations you would like to view.

PERFORM THE REQUESTED SIMULATIONS. PROMPT THE USER TO PERFORM SEVERAL SIMULATIONS. – APPROX 5-10 MINUTES TOTAL ANALYSIS TIME

Please fill out Part 3 of the questionnaire.

PAUSE FOR USER TO FILL OUT QUESTIONNAIRE – APPROX. 5 MINUTES

Finally we would like you to be creative and design a brand new working space that will better serve the needs of the graduate students with respect to daylighting. You may site this space anywhere on campus, you are not restricted to renovating the existing space. Let me know when you are finished.

PAUSE FOR USER TO BUILD A NEW DESIGN.

Now we are ready to do the daylighting analysis of the design. Again, please request any single time/day simulations you would like to view or time-lapse animations you would like to view.

PERFORM THE REQUESTED SIMULATIONS. PROMPT THE USER TO PERFORM SEVERAL SIMULATIONS. – APPROX 5-10 MINUTES TOTAL ANALYSIS TIME

Please fill out Part 4 of the questionnaire, and finally your name, address and consent for publication.

PAUSE FOR USER TO FILL OUT PAPERWORK – APPROX. 5 MINUTES

Thanks for your participation in the study. I'd be happy to answer any questions you have about our research.