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| HKUPSY |
| Experiment1 |
| Class Analysis (In progress) |

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| Wayne  12/17/2010 |

# Potential Classes

Potential classes are highlighted in the use case descriptions below:

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| Use Case Name: | Do the experiment | |
| Use Case Number: | #1 | |
| Actors: | Subject, Researcher | |
| Description: | Subject does the experiment | |
| Pre-condition: | N/A | |
| Post-condition: | N/A | |
| Assumption: | Researcher set the experiment mode in the configuration | |
| Typical course of events | Actors | System |
| Step 1. Initiate the use case when the system is ready for the actor to carry out the experiment.  Step 2. Include use case #3 “Configure”.  Step 5. Press the space bar to start the experiment.  Step 8. Press up-arrow key or down-arrow key to adjust the shape of the 2D-view, such as pressing the up-arrow key for increasing the radius, and the down-arrow key for decreasing the radius.  Step 10. Press the space bar to confirm the modification, or go back to Step 8 to adjust again.  Step 11. Check if it is the end of the experiment. | Step 3. Show the string “Press Space Bar to Start”.  Step 4. Check if it is the start of a new section.  Step 6. Choose one object from the object base randomly, and randomly choose the parameters for the object, such as slant, rotation speed, height, tilt, project method in 2D-view and so on.  Step 7. Show the 3D-view of the object at the left part of the screen, and continually rotate it by the y-axis back and forth; Show the 2D-view of the object from the y-axis (top of the object) on the right part of the screen, using selected projection mode. The shape of the 2D-view may be distorted (zoomed, enlarged, using a random radius etc.).  Step 9. Update the adjusted 2D-view according to the key the subject pressed.  Step 11. Record the all available information of the trial, such as trial number, object number, initial aspect ratio, aspect ratio after adjustment, and so on.  Step 12. Show “Experiment finished” and exit the program. |
| Alternative course of events | Step 4. If it is the start of the new section, also show the progress on the screen in terms of sections, including current section number, and total number of sections.  Step 11. If it is not the end of the experiment, go back to step 3 | |

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| Use Case Name: | Do the practice | |
| Use Case Number: | #2 | |
| Actors: | Subject, Researcher | |
| Description: | Subject does the practice | |
| Pre-condition: | N/A | |
| Post-condition: | N/A | |
| Assumption: | Researcher set the practice mode in the configuration | |
| Typical course of events | Actors | System |
| Step 1. Initiate the use case when the system is ready for the actor to carry out the experiment.  Step 2. Include use case #3 “Configure”.  Step 5. Press the space bar to start the experiment.  Step 8. Press up-arrow key or down-arrow key to adjust the shape of the 2D-view, such as pressing the up-arrow key for increasing the radius, and the down-arrow key for decreasing the radius.  Step 10. Press the space bar to confirm the modification, or go back to Step 8 to adjust again.  Step 11. Check if it is the end of the experiment. | Step 3. Show the string “Press Space Bar to Start”.  Step 4. Check if it is the start of a new section.  Step 6. Choose one object from the object base randomly, and randomly choose the parameters for the object, such as slant, rotation speed, height, tilt, project method in 2D-view and so on.  Step 7. Show the 3D-view of the object at the left part of the screen, and continually rotate it by the y-axis back and forth; Show the 2D-view of the object from the y-axis (top of the object) on the right part of the screen, using selected projection mode. The shape of the 2D-view may be distorted (zoomed, enlarged, using a random radius etc.).  Step 9. Update the adjusted 2D-view according to the key the subject pressed.  Step 11. Show the correct 2D-view of the object along with the one by the adjustment of the subject overlapped. The correct one should be in a different line style or color.  Step 12. Show “Practice finished” and exit the program. |
| Alternative course of events | Step 4. If it is the start of the new section, also show the progress on the screen in terms of sections, including current section number, and total number of sections.  Step 11. If it is not the end of the experiment, go back to step 3 | |

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| Use Case Name: | Configure | |
| Use Case Number: | #3 | |
| Actors: | Researcher | |
| Description: | Researcher sets the configuration of the experiment before it starts | |
| Pre-condition: | N/A | |
| Post-condition: | N/A | |
| Assumption: | N/A | |
| Typical course of events | Actor | System |
| Step 1. Initiate the use case when the system is started and ready for configuration  Step 3. Researcher sets and confirms the configuration on the configuration window. | Step 2. Show the configuration windows. The window contains setting for the mode of the experiment (practice or not), number of sections, number of trials in each section, whether using orthogonal projection or perspective projection or both in 2D-views, subject id, and automatically generated suggested output filename and so on.  Step 4. Initialize the system using the configuration and end the use case. |
| Alternative course of events | N/A | |

So the potential classes are analyzed in the Table 1.

Table Analyze potential classes

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| **Potential Object list** |  | **Reason** |
| Experiment | √ | “experiment” Class |
| Subject | × | Actor, outside the scope of the system |
| Researcher | × | Actor, outside the scope of the system |
| Configuration | × | Collection of attributes, but all should be the attributes of the experiment |
| system | × | unclear |
| String | × | Non-persistent |
| Section | × | Non-persistent, only a concept to describe a collection of trials |
| Space bar | × | Outside scope of the system |
| Object | √ | “testObject” class |
| Object base | × | A collection of Object |
| Parameters for the object | × | Properties of “testObject” |
| Slant | × | Maybe a property of “testObject” |
| Rotation speed | × | Property of “testObject” |
| Height | × | Property of “testObject” |
| Tilt | × | Property of “testObject” |
| Projection method in 2D-view | × | Property of “testObject” |
| 3D-view of the object | × | Unclear |
| Screen | × | External role |
| Shape | × | Unclear |
| Radius | × | Property of “testObject” |
| Up-arrow key | × | Outside scope of the system |
| Down-arrow key | × | Outside scope of the system |
| Modification | × | Unclear |
| All available information of the trial | × | Properties of the “trial” |
| Trial number | × | Property of the “trial” |
| Object number | × | Property of the “trial” and/or “testObject” |
| Initial aspect ratio | × | Property of the “trial” and/or “testObject” |
| Aspect ratio after adjustment | × | Property of the “trial” and/or “testObject” |
| Progress | × | Property of the “experiment” |
| Current section number | × | Property of the “experiment” |
| Total number of sections | × | Property of the “experiment” |
| Practice | × | A possible choice of the experiment mode |
| Correct 2D-view of the object | × | unclear |
| Line style | × | Possible Property of the “testObject” |
| Color | × | Possible Property of the “testObject” |
| Configuration windows | × | Non-persistent |
| Setting for the mode of the experiment | × | Property of the “experiment” |
| Number of sections | × | Property of the “experiment”, synonym |
| Number of trials in each section | × | Property of the “experiment” |
| Orthogonal projection | × | unclear |
| Perspective projection | × | unclear |
| Subject id | × | Property of the “experiment” |
| Output filename | × | Property of the “experiment” |
| Trials | √ | “trial” class |

Therefore, there are three classes at analysis stage. They are experiment, testObject, and trial.