HAT Accompanying Tools Manual

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Overview

This is a manual for a software application with tools accompanying the HAT asset. The application is standalone and does not need to be integrated either with the asset or a game. The Figure 1 provides a screenshot of the first window that appears when the application is launched. The application offers two tools. Pressing the "Start Data Manager" button launches a tool (Figure 2) for managing data in "*HATAssetAppSettings.xml*" and "*gameplaylogs.xml*" files. Pressing the "Start Data Visualizer" button launches a tool for analysis and visualization of data (Figure 5).
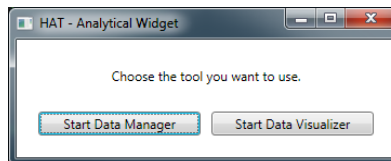

Figure 1: The first window that appears when the application is launched.

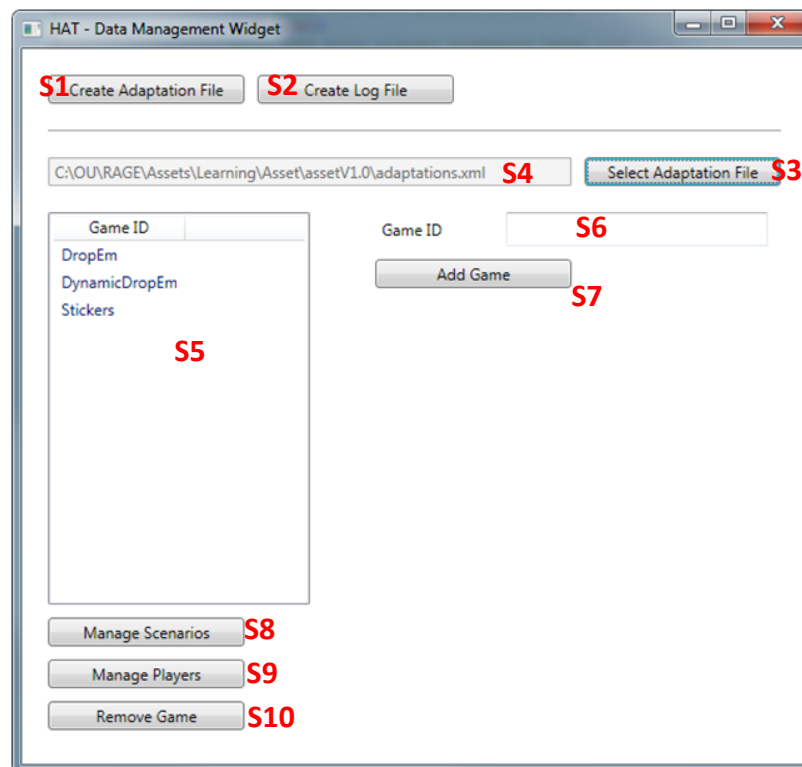## Working with the data management tool

Figure 2: The main window of the data management tool.

Action A1: Creating a template for the adaptation file ("HATAssetAppSettings.xml"):
1. Press the "Create Adaptation File" button (S1 in Figure 2).
2. Indicate the file name and where it should be saved.
The resulting file should contain following XML code shown in Code Snippet 1.

Code Snippet 1:
```
<?xml version="1.0" encoding="UTF-8"?>
<AdaptationData>
    <Adaptation AdaptationID="Game difficulty - Player skill" />
</AdaptationData>
```

Action A2: Creating a template for the gameplay logs file ("gameplaylogs.xml"):
1. Press "Create Log File" button (S2 in Figure 2).
2. Indicate the file name and where is should be saved.
The resulting file should contain following XML code shown in Code Snippet 2.

Code Snippet 2:
```
<?xml version="1.0" encoding="UTF-8"?>
<GameplaysData>
    <Adaptation AdaptationID="Game difficulty - Player skill" />
</GameplaysData>
```

Action A3: Opening existing adaptation file ("HATAssetAppSettings.xml"):
1. Press "Select Adaptation File" button (S3 in Figure 2).
2. Navigate to an existing adaptation file (the default name is "HATAssetAppSettings.xml") and open it.
3. If the file was opened successfully then its path will be shown in the text field (S4 in Figure 2).
4. If there are games specified in the adaptation file then the list of games is shown in the left column (S5 in Figure 2).

Action A4: Adding a new game
1. Open the adaptation file if it was not already done (see Action A3).
2. Enter a unique identifier for the new game the text field (S6 in Figure 2).
3. Press the "Add Game" button (S7 in Figure 2).
4. If successfully added, the new game ID should appear in the list S5.

Action A5: Viewing a list of scenarios in a game
1. Select a game from the list (S5 in Figure 2).
2. Press "Manage Scenarios" button (S8 in Figure 2).
3. The scenario management window will appear with a list of scenarios (S1 in Figure 3) available for the chosen game.
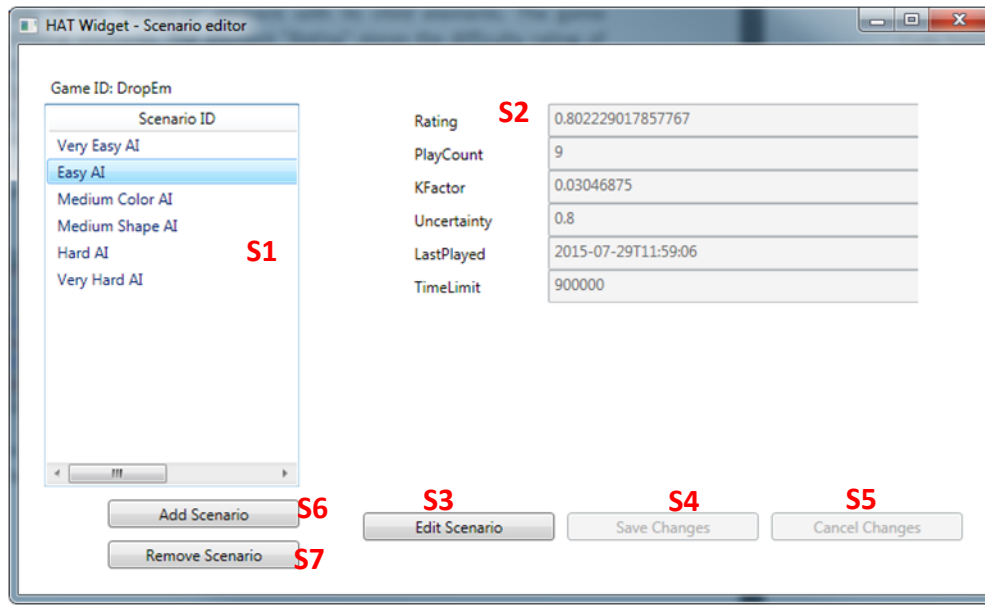
Figure 3: A window for managing game scenarios.

Action A6: Viewing properties of a game scenario
1. Open the scenario management window (see Action A5).
2. Select a scenario from the list (S1 in Figure 3).
3. Properties with their values will be shown in the right panel (S2 in Figure 3).

Action A7: Editing properties of a game scenario
1. Select a scenario (see Action A6).
2. Press "Edit Scenario" button (S3 in Figure 3).
3. Text fields for property values (S2 in Figure 3) will become editable.
4. Make changes to property values and press the "Save Changes" button (S4 in Figure 3). Or press "Cancel Changes" button to discard any changes (S5 in Figure 3).

Action A8: Adding a new game scenario
1. Open the scenario management window (see Action A5).
2. Press the "Add Scenario" button (S6 in Figure 3).
3. A new window will appear. Specify a unique ID for the scenario. Specify values for individual properties if default values are not applicable. Press the "Add" button to add the new scenario.
4. If the scenario was successfully added then its ID should appear in the list (S1 in Figure 3).

Action A9: Removing a game scenario
1. Select a scenario (see Action A6).
2. Press the "Remove Scenario" button (S7 in Figure 3).
3. If the scenario was successfully removed then its ID should disappear from the list (S1 in Figure 3).

Action A10: Viewing a list of players in a game
1. Select a game from the list (S5 in Figure 2).
2. Press "Manage Players" button (S8 in Figure 2).

3. The player management window will appear with a list of players (S1 in Figure 4) available for the chosen game.
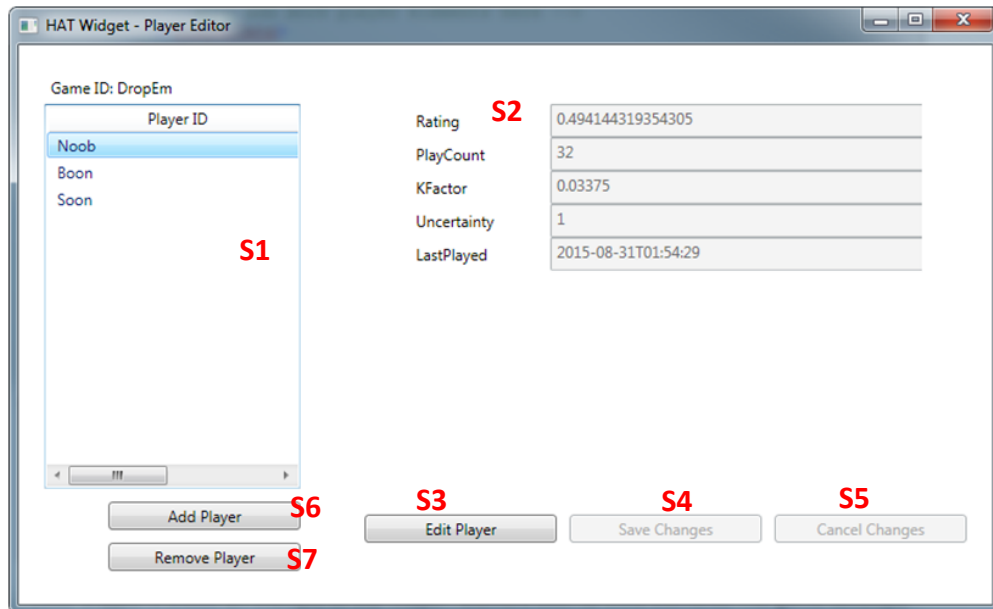

Figure 4: A window for managing game players.

Action A11: Viewing properties of a game player
1. Open the player management window (see Action A10).
2. Select a player from the list (S1 in Figure 4).
3. Properties with their values will be shown in the right panel (S2 in Figure 4).

Action A12: Editing properties of a game player
1. Select a player (see Action A11).
2. Press "Edit Player" button (S3 in Figure 4).
3. Text fields for property values (S2 in Figure 4) will become editable.
4. Make changes to property values and press the "Save Changes" button (S4 in Figure 4). Or press "Cancel Changes" button to discard any changes (S5 in Figure 4).

Action A13: Adding a new game player
1. Open the player management window (see Action A10).
2. Press the "Add Player" button (S6 in Figure 4).
3. A new window will appear. Specify a unique ID for the player. Specify values for individual properties if default values are not applicable. Press the "Add" button to add the new player.
4. If the player was successfully added then its ID should appear in the list (S1 in Figure 4).

Action A14: Removing a game player
1. Select a player (see Action A11).
2. Press the "Remove Player" button (S7 in Figure 4).
3. If the player was successfully removed then its ID should disappear from the list (S1 in Figure 4).

Action A15: Removing a game

1. Select a game from the list in the main window (S5 in Figure 2).
2. Press "Remove Game" button (S10 in Figure 2).
3. If the game was successfully removed then it should not be shown in the list (S5 in Figure 2).

NOTE: Information about all scenarios and players within the game will be deleted together with the game.

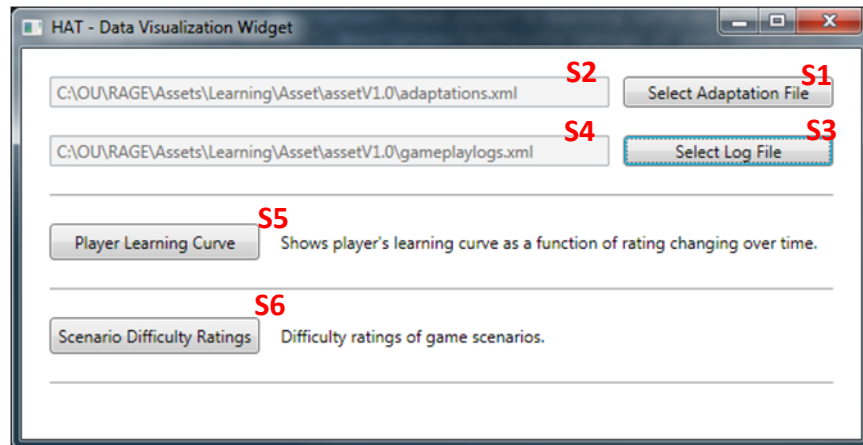## Working with the data analysis and visualization tool.

Figure 5: The main window of the data analysis and visualization tool.

Action L1: Opening XML files
1. Press "Select Adaptation File" button (S1 in Figure 5).
2. Navigate to an existing adaptation file (the default name is "HATAssetAppSettings.xml") and open it.
3. If the file was opened successfully then its path will be shown in the text field (S2 in Figure 5).
4. Press "Select Log File" button (S3 in Figure 5).
5. Navigate to an existing logs file (the default name is "gameplaylogs.xml") and open it.
6. If the file was opened successfully then its path will be shown in the text field (S4 in Figure 5).

Action L2: Visualizing player's learning curve
1. Make sure XML files are loaded (see Action L1).
2. Press "Player Learning Curve" button (S5 in Figure 5)
3. A new window will appear as shown in Figure 6.
4. Select a game from the dropdown box (S1 in Figure 6).
5. Select a player from the list of available players(S2 in Figure 6).
6. Player's learning curve will appear in the right panel (S3 in Figure 6).

The green line shows selected player's learning curve. Points annotated by red indicate gameplays where the player underperformed. The blue line with circular points depict an average learning curve for the group of all players. Two blue lines above and below indicate upper and lower boundaries of standard errors for the group average. Please, refer to the Appendix 1 in the "HATUsabilityDocument.docx" for guidelines on interpreting the learning curve.
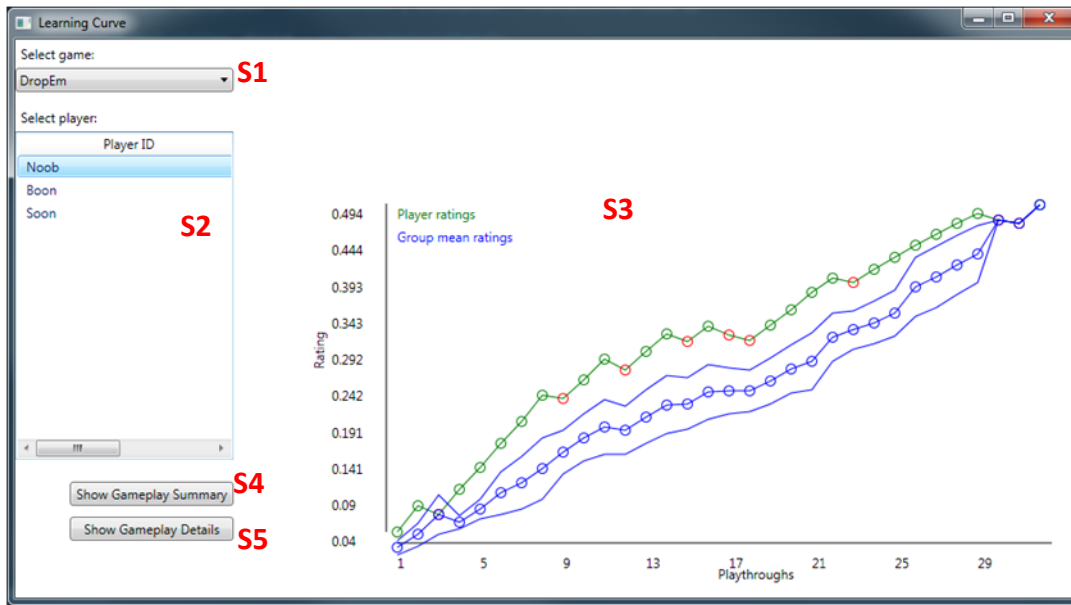
Figure 6: The window for visualizing player's learning curve.

Action L3: Investigating learning barriers for a player

Figure 6 highlights gameplays where player's rating drops. It is possible to retrieve details about scenarios where the player is underperforming by following steps below:

1. Select a player (see Action L2).
2. Press "Show Gameplay Details" button (S5 in Figure 6).
3. A separate window with a list of player's all gameplays (Figure 7) will open.
4. Sort rows by the "RatingTrend" column (S1 in Figure 7).
5. Gameplays highlighted by red are ones where the player underperformed. Other data in the table includes ID of the involved scenario, player's rating, accuracy and the duration of time in millisecond (RT column).

ScenarioID	Timestamp	PlayerRating	Accuracy	RT	RatingTrend
Medium Shape AI	2015-07-29T09:48:47	0.304948275832487	0	244668	DOWN
Easy AI	2015-07-29T09:38:27	0.264469303170702	0	187510	DOWN
Medium Shape AI	2015-07-29T11:32:03	0.385593636425267	0	302277	DOWN
Very Hard AI	2015-07-29T09:29:05	0.224939663262783	0	300328	DOWN
Very Hard AI	2015-07-29T09:57:54	0.306340032670864	0	191727	DOWN
Very Hard AI	2015-07-29T12:02:23	0.467453703303915	0	180606	DOWN
Medium Shape AI	2015-07-29T09:54:42	0.313502179235646	0	152703	DOWN
Easy AI	2015-07-29T11:59:06	0.472029070665533	0	184965	DOWN
Medium Shape AI	2015-07-29T09:07:56	0.0654315945115238	0	230478	DOWN
Hard AI	2015-07-29T10:04:47	0.348634920669716	1	256611	UP
Very Hard AI	2015-07-29T10:07:41	0.372442681029578	1	173465	UP
Medium Color AI	2015-07-29T11:27:00	0.392201569071284	1	170942	UP
Hard AI	2015-07-29T11:50:59	0.468693381423695	1	158654	UP

Close

Figure 7: A window for inspecting scenarios where a player is underperforming.

Action L4: Visualizing game scenarios by increasing ratings
1. Make sure XML files are loaded (see Action L1).
2. Press "Scenario Difficulty Ratings" button (S6 in Figure 5)
3. A new window will appear as shown in Figure 8.
4. Select a game from the dropdown box (S1 in Figure 8).
5. Select "All" from the next dropdown box (S2 in Figure 8).
6. In the right panel (S4 in Figure 8), ratings of all scenarios will be visualized in an increasing order.
7. Press the "Show Gameplay Summary" button (S5 in Figure 8) to see more details about scenarios (such as number of times each scenario was played, success rate of all players in each scenario, average duration of a gameplay involving the scenario). Please, refer to the Appendix 2 in the "HATUsabilityDocument.docx" for guidelines on interpreting the graph.
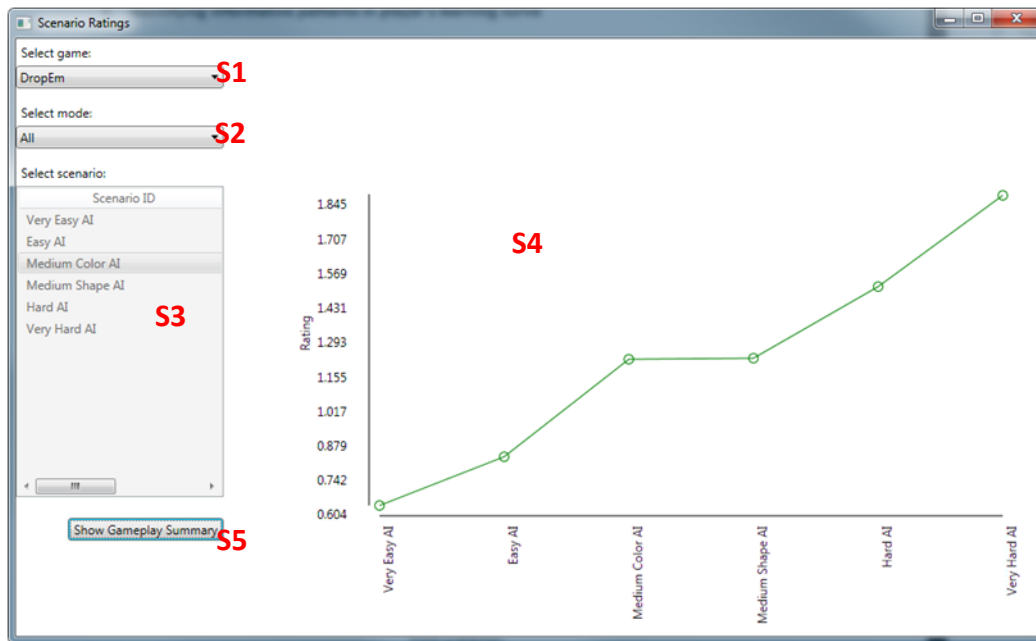

Figure 8: The window for visualizing scenario's difficulty ratings.

Action L5: Showing in changes in scenario's ratings
To see changes in single scenario's rating over individual gameplays follow next steps:
1. Make Sure XML files are loaded (see Action L1)
2. Press "Scenario Difficulty Ratings" button (S6 in Figure 5)
3. A new window will appear as shown in Figure 8.
4. Select a game from the dropdown box (S1 in Figure 8).
5. Select "Individual" from the next dropdown box (S2 in Figure 8).
6. Select a scenario from the list below (S3 in Figure 8).
7. Changes in scenario's rating will be shown in the right panel (S4 in Figure 8).