

Smart History Checker

# Community Auditor

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## 1) What is Community Auditor?

Scientific Community Game (SCG) imposes rules on the community but some of those rules might not be enforced due to bugs in SCG Court, leading to tournaments where good scientific behavior is punished.

To inhibit this behavior we need an independent auditor who checks the SCG rules after the tournament is over. The auditor, which is a new program, reads the History files which includes both Smart and Raw history files, of a binary game and reports any violation of the SCG rules.

## 2) What rules does Community Auditor impose on the SCG?

All the rules are described below with details, however in general, the main focus areas are as follows,

- SCG must follow the Refutation Protocol.
- SCG must follow the Agreement Protocol.
- SCG must follow the Strengthening Protocol.
- SCG must follow the right Kick Justification.
- There must be Zero-Sum reputation at the end of each Binary Game.
- It must answer any irregularities in the History files generated after the Binary Game.

## 3) Rules imposed by Community Auditor

1. Refutation action:
  - a) Opposer must provide the instance.
  - b) Proposer must solve the instance.
  - c) If refutation is successful, then the reputation of opposer must be greater than reputation of proposer.
  - d) If refutation is unsuccessful, then the reputation of opposer must less than the reputation of proposer.
2. Strengthening action:
  - a) Proposer must provide the instance.
  - b) Opposer must solve the instance.
  - c) If Strengthening is successful, then the reputation of opposer must be greater than reputation of proposer.
  - d) If Strengthening is unsuccessful, then the reputation of opposer must be less than the reputation of proposer.

3. Agreement action:
  - a) Proposer must provide the instance.
  - b) Opposer must solve the instance.
  - c) If agreement is successful, then the reputation of player shouldn't change.
  - d) If agreement is unsuccessful, then the reputation of opposer must be less than the reputation of proposer.
4. Other rules:
  - a) The solution provided by any player must be a valid solution, based on the configuration file.
  - b) There must be one provide and one solve response for an oppose action.
  - c) The reputation of the players in a Binary Game must have a zero-sum property.

#### 4) Executing Community Auditor

To run community auditor:

- 1) Create a folder and put the smart history folder containing smart history files and the raw history folder containing corresponding raw history files in that folder.
- 2) Smart history folder should be named as "Smart History".
- 3) Raw history folder should be named as "Raw History".
- 4) Create a text file named "config.txt" containing the playground configuration.
- 5) Go to GenericSCG\gen\scg.history and run CommunityAuditor.java as Java Application.
- 6) Enter the folder path created at the first step into the dialog box.
- 7) An output file named "output.txt" will be generated in that folder with the violations.

\* Smart history file name and its corresponding raw history file name should be same. Do not change file names.

#### 5) Implementation of Community Auditor in current SCG

- a) We have used the interface OpposeAction (GenericSCG\gen\scg\OpposeAction.java).
- b) This interface contains an abstract method "checkResponse" as seen in the class diagram below.
- c) For every given oppose action in a Binary game, this method returns a String with Violations.
- d) This method is then implemented in all the oppose action classes ,i.e., Refuting, Strengthening, Agreement in their respective files.

- e) A method named audit is implemented in CommunityAuditor.java to notify violations. Some other methods, i.e., checkForKickAction, checkKickViolation, checkSmartHistory, are implemented to check raw history for kick actions, and smart history for SCG rule violations. The abstract checkResponse method is called in checkSmartHistory method.

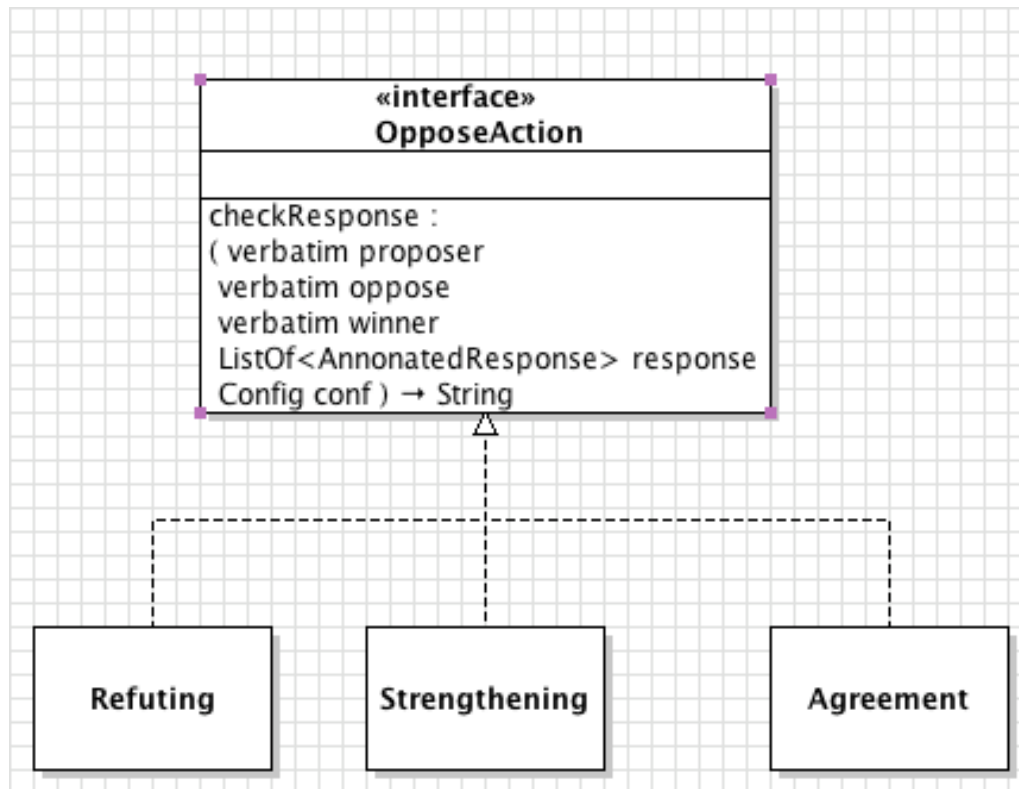


Figure 1. Class Diagram for opposeAction interface.

## 6) Comparing Smart History Files

Apart from checking violations Community auditor has also another important role which is comparing smart histories. This feature can be used for regression testing.

To compare two smart history files:

- 1) Go to GenericSCG\gen\scg.history and run CompareSmartHistory.java as Java Application.
- 2) Enter the first smart history file path into the dialog box.
- 3) Enter the second smart history file path into the dialog box.
- 4) A result message will be appeared in the console.