Zappy architecture

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Chapter 1

Jenkins CI/CD Pipeline for Zappy

This directory contains the configuration for a Jenkins CI/CD pipeline that automates building, testing, and reporting for the Zappy project.

1.1 Features

- **Multi-Job Pipeline**: Sequential jobs organized in branch-specific folders
  - Coding Style Check
  - Build
  - Tests
  - Dashboard
- **Comprehensive Testing**: Unit tests with coverage reports for server, GUI, and AI components
- **Automated Reporting**: Visual dashboards and summary reports

1.2 Setup Instructions

1.2.1 Requirements

- Docker and Docker Compose
- Git access to the Zappy repository

1.2.2 Getting Started

1. **Start Jenkins**:
   ```
   cd jenkins
   docker-compose up -d
   ```
2. **Access Jenkins**:
   - Open `http://localhost:8080` in your browser
   - Jenkins is pre-configured with necessary plugins and jobs
3. **Run the Pipeline**:
   - Navigate to the "Pull Branch from Zappy" job
   - Provide the branch name (default is "main")
   - Click "Build"

1.3 Troubleshooting

1.3.1 Plugin Issues

If you encounter issues with plugins:

1. Run the plugin diagnostics script inside the container:
   ```
   docker exec zappipicaca /var/jenkins_home/plugin_diagnostics.sh
   ```
2. Verify the plugins are properly installed:
   ```
   docker exec zappipicaca ls -la /var/jenkins_home/plugins/
   ```

1.3.2 Fork Test Issues

The pipeline automatically disables problematic fork tests that cause crashes in the Jenkins environment. This is handled by the `fix_fork_tests.sh` script.

1.3.3 Coverage Issues

If tests fail but you still want coverage reports, the pipeline uses `run_coverage_with_workaround.sh` to ensure coverage reports are generated even if some tests fail.

1.4 Custom Scripts

- **fix_fork_tests.sh**: Disables problematic fork tests in Jenkins
- **fix_audio_issues.sh**: Addresses audio driver issues in GUI tests
- **run_coverage_with_workaround.sh**: Generates coverage even when tests fail
- **pipeline_summary.sh**: Creates textual summary of pipeline execution
- **pipeline_visualization.sh**: Creates visual ASCII representation of pipeline
- **plugin_diagnostics.sh**: Diagnoses plugin installation issues
- **memory_diagnostics.sh**: Reports memory usage and leaks

1.5 Maintenance

1.5.1 Adding New Jobs

To add a new job to the pipeline:

1. Update the `job_dsl.groovy` file with your new job definition
2. Ensure proper downstream triggering for sequential execution
3. Rebuild the "Pull Branch from Zappy" job

1.5.2 Updating Plugins

To update or add plugins:

1. Add the plugin to `plugins.txt`
2. Rebuild the Docker image:
   ```
   docker-compose down
   docker-compose build --no-cache
   docker-compose up -d
   ```

Chapter 2

README

2.1 ZAPPY

A multiplayer network strategy game where teams compete for supremacy!

[](LICENSE) "" "![Languages](https://img.shields.io/badge/Languages-C%2B%2B%20%7C%20C%20%7C%20Python-orange?style=for-the-badge)"

2.1.1 About The Project

Zappy is an exciting network-based strategy game where multiple teams compete on a tile-based map filled with resources. The objective is strategic: be the first team to get **at least 6 players** to reach the **maximum elevation level**.

2.1.1.1 Key Features

- **Multiplayer Network Game** - Real-time competition between teams
- **Dynamic Tile Map** - Resource-rich environment for strategic gameplay
- **Team-Based Strategy** - Collaborate with teammates to achieve victory
- **Multiple Interfaces** - Server, GUI client, and AI bot components
- **Real-time Visualization** - Watch the action unfold with the GUI
- **AI Integration** - Develop and deploy intelligent bots

2.1.2 Architecture

The project consists of three main components:

```
Zappy
  Server      - Core game engine and network management
  GUI Client  - Real-time game visualization interface
  AI Bot      - Intelligent automated players
```

2.1.2.1 Technologies Used

Component	Language	Framework/Libraries
Server	C	Custom networking
GUI	C++	Graphics libraries
AI Bot	Python	Socket programming

2.1.3 Quick Start

2.1.3.1 Prerequisites

Before running Zappy, ensure you have:

- **C/C++ Compiler** (gcc/g++)
- **Python 3.x**
- **Make** build system
- **PDF-LaTeX** (for documentation generation)
- **Raylib** graphics library
- **SFML** audio library

2.1.3.2 Installation

1. **Install RayLib** (only if you don't already have the lib) **Ubuntu**:
   ```
   apt install libraylib-dev
   ```

   Other distributions:
   ```
   git clone https://github.com/raysan5/raylib.git raylib
   cd raylib
   mkdir build && cd build
   cmake -DSHARED=ON -DBUILD_EXAMPLES=OFF -DCMAKE_POSITION_INDEPENDENT_CODE=ON ..
   make -j$(nproc)
   make install
   ldconfig
   cd ../..
   ```

2. **Install SFML** (only if you don't already have the lib) **Ubuntu**:
   ```
   apt install libsfml-dev
   ```

   Other distributions:
   ```
   wget https://github.com/SFML/SFML/archive/refs/heads/2.3.x.zip
   unzip 2.3.x.zip && cd 2.3.x
   mkdir build && cd build
   cmake .. -DCMAKE_BUILD_TYPE=Release -DBUILD_SHARED_LIBS=ON
   make -j$(nproc)
   make install
   ```

3. **Clone the repository**
   ```
   git clone <repository-url>
   cd zappy
   ```

4. **Build all components**
   ```
   make
   ```

   This will compile:

   - `zappy_server` - The game server
   - `zappy_gui` - The graphical interface
   - `zappy_ai` - The AI bot

5. **Run the game**

   Start the server:
   ```
   ./zappy_server -p <port> -x <width> -y <height> -n <team1> <team2> ... -c <nb_clients> -f <freq>
   ```

   Launch the GUI:
   ```
   ./zappy_gui -p <port> -h <hostname>
   ```

   Deploy AI team:
   ```
   ./zappy_ai -p <port> -n <team_name> -h <hostname>
   ```

2.1.4 Documentation

2.1.4.1 Docusaurus Documentation

Start the interactive documentation:

```
cd documentation/my-zappy-doc
npx docusaurus start
```

> **Troubleshooting:** If you encounter `npm error could not determine executable to run`, run:
> ```
> npm install --save-dev @docusaurus/types
> ```

2.1.4.2 PDF Documentation (Doxygen)

Generate comprehensive PDF documentation:

> **Important:** Move the `my-zappy-doc` folder out of the repository before generation due to Unicode emoji conflicts.

```
./generateDoc.sh
```

Requirements: Ensure `pdf-latex` library is installed on your system.

2.1.5 Contributing

We follow a structured commit convention to maintain code quality and project organization.

2.1.5.1 Commit Convention

Format: `[Gitmoji] : [Element/Module] : [MESSAGE]`

- **Gitmoji**: Appropriate emoji for the modification type
- **Element/Module**: The component you modified
- **MESSAGE**: Detailed description of changes

2.1.5.2 Gitmoji Reference

Code Features

Emoji	Code	Usage
	`:sparkles:`	Introduce new features
	`:recycle:`	Refactor/update code
	`:bug:`	Fix a bug
	`:poop:`	Remove coding style errors or temporary fix
	`:rotating_↩ light:`	Fix compiling warnings
	`:fire:`	Remove code or files

Testing

Emoji	Code	Usage
	`:white_check_↩ mark:`	Add, update, or pass tests

Architecture

Emoji	Code	Usage
	`:see_no_evil:`	Add or update .gitignore files

Emoji	Code	Usage
	:construction_worker:	Add or update CI build system
	:building_↩ construction:	Make architectural changes
	:memo:	Add or update documentation

Pull Requests

Emoji	Code	Usage
	:tada:	**Must be used for each PR created!**
	↩ :lipstick↩ :	**Must be used for each PR merged!**
	:rewind:	**Must be used for each revert done!**

2.1.6 Git Commands Reference

2.1.6.1 Commit Management

Modify commit message (before push):
```
git commit --amend -m "New commit message"
```
Modify commit message (after push):
```
git commit --amend -m "New commit message"
git push --force
```

2.1.6.2 File Management

Unstage accidentally added file (not yet pushed):
```
git restore --staged <file>
```
Remove file from commit (after commit):
```
git reset --soft HEAD~1
git restore --staged file-to-remove.txt
git commit -m "New commit message (without the file)"
```

2.1.7 Testing

Run the comprehensive test suite:
```
# Unit tests
make tests_run

# Functional tests
cd tests/functional
python3 Tester.py
```
Coverage reports are automatically generated in `coverage_report/`.

2.1.8 Jenkins CI/CD

This project includes a fully configured Jenkins pipeline to automate building, testing, and quality checking.

2.1.8.1 Getting Started with Jenkins

1. **Start the Jenkins container**:
   ```
   make jenkins
   ```
2. **Access the Jenkins interface**:
   - Open http://localhost:8080 in your browser
   - Login with credentials (check the `.env` file or ask a team member)
3. **Run the pipeline**:
   - Navigate to the "Pull Branch from Zappy" job
   - Enter your branch name (default is "main")
   - Click "Build"

4. **Stop the Jenkins container**:
```
make jenkins_stop
docker-compose -f jenkins/docker-compose.yml down -v // to remove volumes
```

2.1.8.2 Pipeline Jobs

The CI/CD pipeline consists of the following sequential jobs:

1 Coding Style Check

- **Purpose**: Verifies adherence to Epitech coding standards
- **Components Checked**:
  - C coding style (`cStyleChecker.sh`)
  - C++ coding style (`cppStyleChecker.sh`)
  - Python coding style (`pythonStyleChecker.sh`)
- **Trigger**: Automatic on each commit or manual execution

2 Build

- **Purpose**: Compiles all project components
- **Steps**:
  - Build server (`make zappy_server`)
  - Build GUI (`make zappy_gui`)
  - Build AI (`make zappy_ai`)
  - Verify clean/rebuild works (`make clean`, `make fclean`, `make re`)
- **Trigger**: Automatic after successful style check

3 Tests

- **Purpose**: Runs comprehensive test suite with coverage
- **Features**:
  - Sets up testing environment (GUI tests, audio configuration)
  - Runs unit tests with coverage reporting
  - Fixes common testing issues automatically
- **Trigger**: Automatic after successful build

4 Dashboard

- **Purpose**: Generates reports and visualizations
- **Outputs**:
  - Pipeline summary report
  - Visual pipeline progress representation
  - Test results and coverage statistics
- **Trigger**: Automatic after tests (even on failure)

2.1.8.3 Troubleshooting

If the pipeline fails:

1. **Check the console output** for the failing job
2. **View artifact reports** for detailed error information
3. **Run specific diagnostic scripts**:
```
# From host machine
docker exec zappipicaca /var/jenkins_home/plugin_diagnostics.sh
docker exec zappipicaca /var/jenkins_home/memory_diagnostics.sh
```

2.1.8.4 Viewing Reports

- Access coverage reports and artifacts from the Jenkins job page
- Click on "Artifacts" in the left sidebar of a completed job
- Download and view generated reports locally

2.1.9 Team

Project developed by EPITECH students

- Eliott Tesnier
- Albane Merian
- Nolan Papa
- Matisse Marsac
- Alban Roussée
- Noa Roussière

Chapter 3

Hierarchical Index

3.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 4

Class Index

4.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 5

File Index

5.1 File List

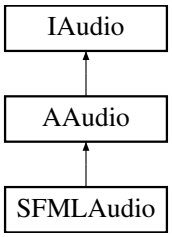
Here is a list of all documented files with brief descriptions:

Chapter 6

Class Documentation

6.1 AAudio Class Reference

Inheritance diagram for AAudio:



Public Member Functions

- float getSFXVolumeLevel ()
- float getMusicVolumeLevel ()
- void setSFXVolumeLevel (float)
- void setMusicVolumeLevel (float)
- void playMainTheme (float volume)
- void playNextTheme (float volume)

Public Member Functions inherited from IAudio

- virtual bool **loadSound** (const std::string &id, const std::string &filepath)=0
- virtual void **playSound** (const std::string &id, float volume)=0
- virtual void **stopSound** (const std::string &id)=0
- virtual bool **isSoundPlaying** (const std::string &id) const =0
- virtual void **setSoundLooping** (const std::string &id, bool looping)=0
- virtual void **setSoundVolume** (const std::string &id, float volume)=0

Protected Attributes

- std::vector< std::string > **_musicId** = {"main_theme", "main_theme2"}
- std::vector< std::string > _sfxId
- float **_levelSFX** = 75.f
- float **_levelMusic** = 50.f
- int **_themeIndex** = 0

6.1.1 Member Function Documentation

6.1.1.1 getMusicVolumeLevel()

```
float AAudio::getMusicVolumeLevel ( )  [virtual]
```

Implements IAudio.

6.1.1.2 getSFXVolumeLevel()

```
float AAudio::getSFXVolumeLevel ( )  [virtual]
```

Implements IAudio.

6.1.1.3 playMainTheme()

```
void AAudio::playMainTheme (
            float volume )  [virtual]
```

Implements IAudio.

6.1.1.4 playNextTheme()

```
void AAudio::playNextTheme (
            float volume )  [virtual]
```

Implements IAudio.

6.1.1.5 setMusicVolumeLevel()

```
void AAudio::setMusicVolumeLevel (
            float level )  [virtual]
```

Implements IAudio.

6.1.1.6 setSFXVolumeLevel()

```
void AAudio::setSFXVolumeLevel (
            float level )  [virtual]
```

Implements IAudio.

6.1.2 Member Data Documentation

6.1.2.1 _sfxId

```
std::vector<std::string> AAudio::_sfxId  [protected]
```

Initial value:

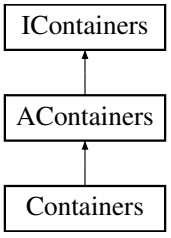
```
= {"click", "clickPlayer", "collect",
                                                "win", "loose", "zap", "splash_screen"}
```

The documentation for this class was generated from the following files:

- gui/src/Audio/AAudio.hpp
- gui/src/Audio/AAudio.cpp

6.2 AContainers Class Reference

Inheritance diagram for AContainers:



Public Member Functions

- **AContainers** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- void setSize (float width, float height) override
- FloatRect getBounds () const override
- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- RelativePosition **getRelativePosition** () const
- void **updatePositionFromRelative** ()
- float **getWidth** () const
- float **getHeight** () const

Public Member Functions inherited from IContainers

- virtual void **draw** ()=0
- virtual void **update** ()=0

Protected Attributes

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- RelativePosition **_relativePos**
- Color32 **_backgroundColor**
- bool **_visible**
- bool **_hasBackground**

6.2.1 Member Function Documentation

6.2.1.1 contains()

```
bool AContainers::contains (
            float x,
            float y ) const  [override], [virtual]
```

Implements IContainers.

6.2.1.2 getBounds()

```
FloatRect AContainers::getBounds ( ) const  [override], [virtual]
```

Implements IContainers.

6.2.1.3 isVisible()

```
bool AContainers::isVisible ( ) const  [override], [virtual]
```

Implements IContainers.

6.2.1.4 setPosition()

```
void AContainers::setPosition (
            float x,
            float y )  [override], [virtual]
```

Implements IContainers.

6.2.1.5 setSize()

```
void AContainers::setSize (
            float width,
            float height )  [override], [virtual]
```

Implements IContainers.

6.2.1.6 setVisible()

```
void AContainers::setVisible (
            bool visible )  [override], [virtual]
```

Implements IContainers.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Containers/AContainers.hpp
- gui/src/Graphic/HUD/Containers/AContainers.cpp

6.3 action_queue_s Struct Reference

Public Attributes

- action_request_t * **head**
- action_request_t * **tail**
- int **count**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.4 action_request_s Struct Reference

Public Attributes

- char * **command**
- time_t **timestamp**
- float **time_limit**
- action_priority_t **priority**
- player_t * **player**
- struct action_request_s * **next**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.5 App.App Class Reference

Public Member Functions

- **__init__** (self, dict[str] config)
- int **create_new_player** (self)
- **run** (self)

Public Attributes

- **port**
- **name**
- **ip**
- **running**
- **is_main_process**

- **logger**
- **childs**
- **mainPlayer**

Protected Member Functions

- **_signal_handler** (self, signum, frame)
- **_wait_for_children** (self)
- **_cleanup_children** (self)

Protected Attributes

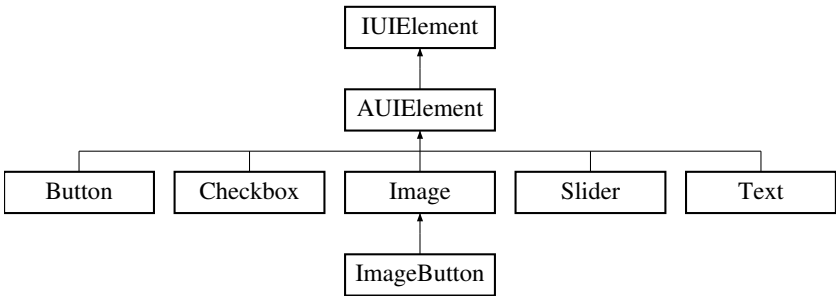
- **_signal_handler**

The documentation for this class was generated from the following file:

- ai/src/App/App.py

6.6 AUIElement Class Reference

Inheritance diagram for AUIElement:



Public Member Functions

- **AUIElement** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- FloatRect getBounds () const override
- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- virtual void setSize (float width, float height)
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- UIRelativePosition **getRelativePosition** () const

Public Member Functions inherited from IUIElement

- virtual void **draw** ()=0
- virtual void **update** ()=0

Protected Attributes

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- UIRelativePosition **_relativePos**
- bool **_visible**

6.6.1 Member Function Documentation

6.6.1.1 contains()

```
bool AUIElement::contains (
            float x,
            float y ) const  [override], [virtual]
```

Implements IUIElement.

6.6.1.2 getBounds()

```
FloatRect AUIElement::getBounds ( ) const  [override], [virtual]
```

Implements IUIElement.

6.6.1.3 isVisible()

```
bool AUIElement::isVisible ( ) const  [override], [virtual]
```

Implements IUIElement.

6.6.1.4 setPosition()

```
void AUIElement::setPosition (
            float x,
            float y )  [override], [virtual]
```

Implements IUIElement.

6.6.1.5 setSize()

```
void AUIElement::setSize (
            float width,
            float height )  [virtual]
```

Implements IUIElement.

6.6.1.6 setVisible()

```
void AUIElement::setVisible (
            bool visible )  [override], [virtual]
```

Implements IUIElement.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/UIElement/AUIElement.hpp
- gui/src/Graphic/HUD/UIElement/AUIElement.cpp

6.7 BoundingBox3D Struct Reference

Public Attributes

- Vector3f **min**
- Vector3f **max**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.8 Broadcaster.Broadcaster Class Reference

Public Member Functions

- None **__init__** (self, Communication com, str team)
- str **revealMessage** (self, str message)
- None **broadcastMessage** (self, str message)

Public Attributes

- **com**
- **hasher**

The documentation for this class was generated from the following file:

- ai/src/Broadcaster/Broadcaster.py

6.9 buffer_s Struct Reference

Public Attributes

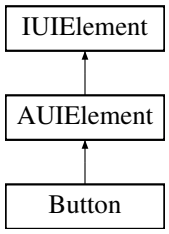
- char **data** [BUFFER_SIZE]
- int **head**
- int **tail**
- int **full**

The documentation for this struct was generated from the following files:

- server/include/buffer.h
- server/src/network/buffer.h

6.10 Button Class Reference

Inheritance diagram for Button:



Public Member Functions

- **Button** (std::shared_ptr< IDisplay > display, std::shared_ptr< IAudio > audio, float x, float y, float width, float height, const std::string &text, std::function< void()> callback)
- void draw () override
- void update () override
- void **setText** (const std::string &text)
- std::string **getText** () const
- void **setCallback** (std::function< void()> callback)
- void **setColors** (Color32 normal, Color32 hover, Color32 pressed, Color32 textColor)
- void setSize (float width, float height) override

Public Member Functions inherited from AUIElement

- **AUIElement** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- FloatRect getBounds () const override
- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- UIRelativePosition **getRelativePosition** () const

Private Attributes

- std::string **_text**
- std::function< void()> **_callback**
- Color32 **_normalColor**
- Color32 **_hoverColor**
- Color32 **_pressedColor**
- Color32 **_textColor**
- bool **_isHovered**
- bool **_isPressed**
- std::shared_ptr< IDisplay > **_display**
- std::shared_ptr< IAudio > **_audio**

Additional Inherited Members

Protected Attributes inherited from AUIElement

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- UIRelativePosition **_relativePos**
- bool **_visible**

6.10.1 Member Function Documentation

6.10.1.1 draw()

```
void Button::draw ( )  [override], [virtual]
```

Implements IUIElement.

6.10.1.2 setSize()

```
void Button::setSize (
            float width,
            float height )  [override], [virtual]
```

Reimplemented from AUIElement.

6.10.1.3 update()

```
void Button::update ( )  [override], [virtual]
```

Implements IUIElement.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Button/Button.hpp
- gui/src/Graphic/HUD/Button/Button.cpp

6.11 CameraManager Class Reference

Public Member Functions

- **CameraManager** (std::shared_ptr< IDisplay > display)
- void **updateCamera** (zappy::gui::CameraMode mode)
- void **updateCameraFreeMode** ()
- void **updateCameraTargetMode** ()
- void **updateCameraPlayerMode** ()
- void **setMapCenter** (const Vector3f &center)
- void **setMapSize** (int width, int height)
- void **setTargetDistance** (float distance)
- void **initTargetPositionFromCurrentCamera** ()

- void **setPlayerId** (int playerId)
- int **getPlayerId** () const
- void **setGameInfos** (std::shared_ptr< GameInfos > gameInfos)
- void **setMapInstance** (std::shared_ptr< Map > map)
- float **getCameraMovingSpeed** ()
- void **setCameraMovingSpeed** (float)
- float **getCameraRotaSpeed** ()
- void **setCameraRotaSpeed** (float)
- float **getCameraZoomSpeed** ()
- void **setCameraZoomSpeed** (float)
- Vector3f **calculatePlayerPosition** (const zappy::structs::Player &player)
- Vector3f **calculateCameraPosition** (const Vector3f &playerPos, float angleXZ)

Private Member Functions

- void **handlePlayerCameraMouseInput** ()

Private Attributes

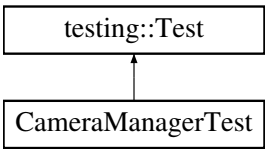
- float **_cameraMovingSpeed** = 15.0f
- float **_cameraRotaSpeed** = 2.0f
- float **_cameraZoomSpeed** = 120.0f
- std::shared_ptr< IDisplay > **_display**
- std::shared_ptr< GameInfos > **_gameInfos**
- std::shared_ptr< Map > **_map**
- Vector3f **_mapCenter**
- int **_mapWidth**
- int **_mapHeight**
- float **_targetDistance**
- float **_targetAngleXZ**
- float **_targetAngleY**
- bool **_isDragging**
- int **_playerId**
- float **_playerAngleXZ**
- bool **_isPlayerViewDragging**

The documentation for this class was generated from the following files:

- gui/src/Graphic/Camera/CameraManager.hpp
- gui/src/Graphic/Camera/CameraManager.cpp

6.12 CameraManagerTest Class Reference

Inheritance diagram for CameraManagerTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

Protected Attributes

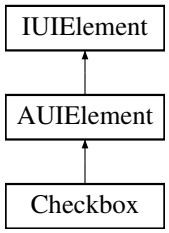
- std::unique_ptr< CameraManager > **cameraManager**
- std::shared_ptr< testing::NiceMock< MockDisplay > > **mockDisplay**
- std::shared_ptr< testing::NiceMock< MockGameInfos > > **mockGameInfos**
- std::shared_ptr< testing::NiceMock< MockMap > > **mockMap**
- std::vector< zappy::structs::Player > **testPlayersList**
- std::vector< zappy::structs::Player > **emptyPlayersList**

The documentation for this class was generated from the following file:

- tests/unit/gui/Camera_manager/Camera_manager_test.cpp

6.13 Checkbox Class Reference

Inheritance diagram for Checkbox:



Public Member Functions

- **Checkbox** (std::shared_ptr< IDisplay > display, std::shared_ptr< IAudio > audio, float x, float y, float width, float height, bool initialValue, std::function< void(bool)> callback)
- void draw () override
- void update () override
- void **setCallback** (std::function< void(bool)> callback)
- void **setValue** (bool value)
- bool **getValue** () const
- void **setColors** (Color32 normalColor, Color32 hoverColor, Color32 pressedColor, Color32 checkColor)
- void setSize (float width, float height) override
- bool **containsCheckbox** (float x, float y) const

Public Member Functions inherited from AUIElement

- **AUIElement** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- FloatRect getBounds () const override
- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- UIRelativePosition **getRelativePosition** () const

Private Attributes

- bool **_value**
- std::function< void(bool)> **_callback**
- Color32 **_normalColor**
- Color32 **_hoverColor**
- Color32 **_pressedColor**

- Color32 **_checkColor**
- bool **_isHovered**
- bool **_isPressed**
- std::shared_ptr< IDisplay > **_display**
- std::shared_ptr< IAudio > **_audio**
- float **_checkboxSize**

Additional Inherited Members

Protected Attributes inherited from AUIElement

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- UIRelativePosition **_relativePos**
- bool **_visible**

6.13.1 Member Function Documentation

6.13.1.1 draw()

```
void Checkbox::draw ( )  [override], [virtual]
```

Implements IUIElement.

6.13.1.2 setSize()

```
void Checkbox::setSize (
            float width,
            float height )  [override], [virtual]
```

Reimplemented from AUIElement.

6.13.1.3 update()

```
void Checkbox::update ( )  [override], [virtual]
```

Implements IUIElement.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Checkbox/Checkbox.hpp
- gui/src/Graphic/HUD/Checkbox/Checkbox.cpp

6.14 CLI Class Reference

Public Member Functions

- **CLI** (int ac, const char ∗const ∗av)
- zappy::structs::Config **parseArguments** (int ac, const char ∗const ∗av) const

Private Member Functions

- bool **hasCorrectNumberOfArguments** (int ac) const
- int **parsePort** (const char ∗portStr) const
- std::string **parseHostname** (const char ∗hostnameStr) const
- void **validateConfig** (bool portFound, bool hostFound) const

Private Attributes

- int **_ac**
- const char ∗const ∗ **_av**

The documentation for this class was generated from the following files:

- gui/src/CLI/CLI.hpp
- gui/src/CLI/CLI.cpp

6.15 CLI.CLI Class Reference

Public Member Functions

- **__init__** (self)
- **parse_args** (self, args)
- **parse_port** (self, port_str)
- **parse_name** (self, name)
- **parse_machine** (self, machine_str)
- **validate_config** (self, port_found, name_found)

Public Attributes

- **port**
- **name**
- **machine**

The documentation for this class was generated from the following file:

- ai/src/CLI/CLI.py

6.16 Client Class Reference

Public Member Functions

- **Client** (int ac, const char ∗const ∗av)
- void **_createGUI** ()

Private Member Functions

- bool **_checkIfCorrectModuleType** (ModuleType_t type, const std::string &path)
- void **initialize** (int ac, const char ∗const ∗av)
- void **_retrieveAllGraphicSharedLib** (const std::string &path="gui/lib/")
- void **_retrieveAllAudioSharedLib** (const std::string &path="gui/lib/")

Private Attributes

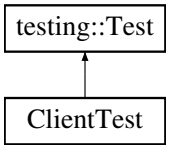
- std::vector< std::string > **_pathLibGraphic**
- std::vector< std::string > **_pathLibAudio**
- zappy::structs::Config **_config**
- std::shared_ptr< ICommunication > **_communication**
- std::shared_ptr< GameInfos > **_gameInfos**
- std::unique_ptr< MsgHandler > **_msgHandler**
- std::shared_ptr< GUI > **_gui**
- std::shared_ptr< GuiObserver > **_guiObserver**

The documentation for this class was generated from the following files:

- gui/src/Client/Client.hpp
- gui/src/Client/Client.cpp

6.17 ClientTest Class Reference

Inheritance diagram for ClientTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override
- char ∗∗ **createArgv** (const std::vector< std::string > &args)
- void **cleanupArgv** (char ∗∗argv, int argc)

Protected Attributes

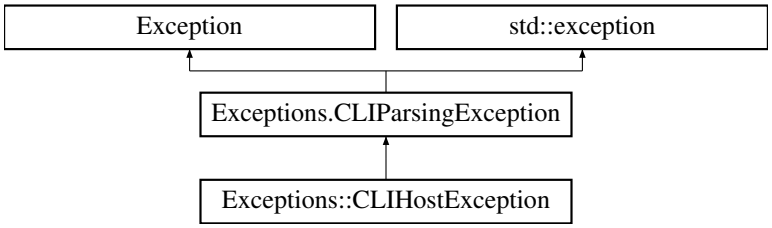
- std::stringstream **buffer**
- std::streambuf ∗ **originalCout**

The documentation for this class was generated from the following file:

- tests/unit/gui/Client/Client_test.cpp

6.18 Exceptions::CLIHostException Class Reference

Inheritance diagram for Exceptions::CLIHostException:



Public Member Functions

- **CLIHostException** (const std::string &message)

Public Member Functions inherited from Exceptions.CLIParsingException

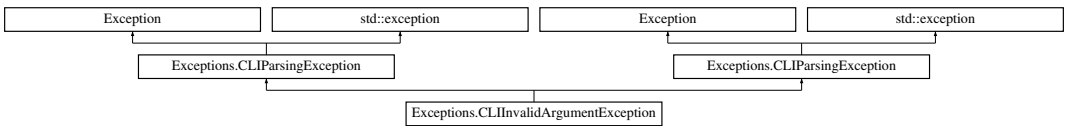
- **__init__** (self, str message)
- **CLIParsingException** (const std::string &message)
- const char ∗ **what** () const noexcept override

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.19 Exceptions.CLIInvalidArgumentException Class Reference

Inheritance diagram for Exceptions.CLIInvalidArgumentException:



Public Member Functions

- __init__ (self, str message)
- **CLIInvalidArgumentException** (const std::string &message)

Public Member Functions inherited from Exceptions.CLIParsingException

- **CLIParsingException** (const std::string &message)
- const char * **what** () const noexcept override

6.19.1 Constructor & Destructor Documentation

6.19.1.1 __init__()

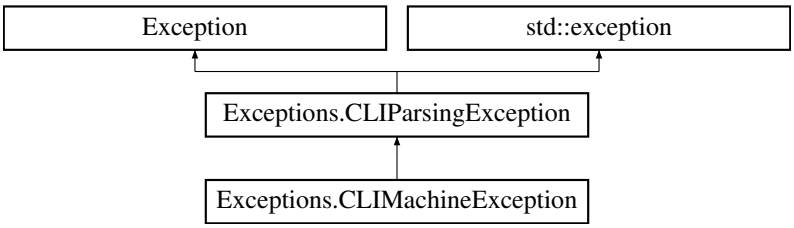
```
Exceptions.CLIInvalidArgumentException.__init__ (
              self,
             str message )
```

Reimplemented from Exceptions.CLIParsingException.
The documentation for this class was generated from the following files:

- ai/src/Exceptions/Exceptions.py
- gui/src/Exceptions/Exceptions.hpp

6.20 Exceptions.CLIMachineException Class Reference

Inheritance diagram for Exceptions.CLIMachineException:



Public Member Functions

- __init__ (self, str message)

Public Member Functions inherited from Exceptions.CLIParsingException

- **CLIParsingException** (const std::string &message)
- const char * **what** () const noexcept override

6.20.1 Constructor & Destructor Documentation

6.20.1.1 __init__()

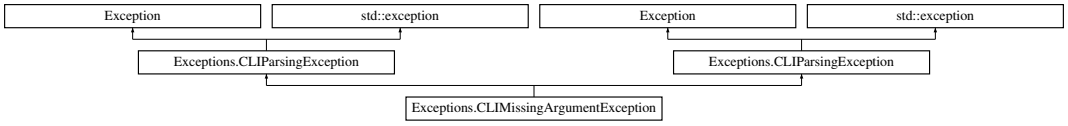
```
Exceptions.CLIMachineException.__init__ (
              self,
             str message )
```

Reimplemented from Exceptions.CLIParsingException.
The documentation for this class was generated from the following file:

- ai/src/Exceptions/Exceptions.py

6.21 Exceptions.CLIMissingArgumentException Class Reference

Inheritance diagram for Exceptions.CLIMissingArgumentException:



Public Member Functions

- __init__ (self, str message)
- **CLIMissingArgumentException** (const std::string &message)

Public Member Functions inherited from Exceptions.CLIParsingException

- **CLIParsingException** (const std::string &message)
- const char * **what** () const noexcept override

6.21.1 Constructor & Destructor Documentation

6.21.1.1 __init__()

```
Exceptions.CLIMissingArgumentException.__init__ (
              self,
             str message )
```

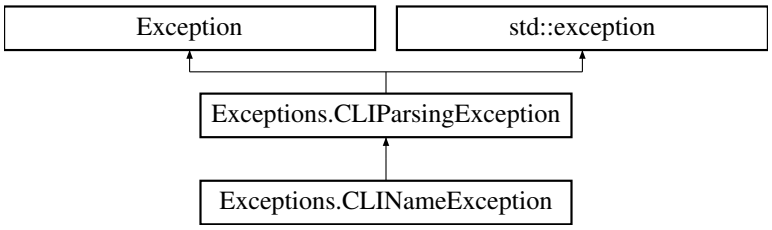
Reimplemented from Exceptions.CLIParsingException.

The documentation for this class was generated from the following files:

- ai/src/Exceptions/Exceptions.py
- gui/src/Exceptions/Exceptions.hpp

6.22 Exceptions.CLINameException Class Reference

Inheritance diagram for Exceptions.CLINameException:



Public Member Functions

- __init__ (self, str message)

Public Member Functions inherited from Exceptions.CLIParsingException

- **CLIParsingException** (const std::string &message)
- const char * **what** () const noexcept override

6.22.1 Constructor & Destructor Documentation

6.22.1.1 __init__()

```
Exceptions.CLINameException.__init__ (
              self,
             str message )
```

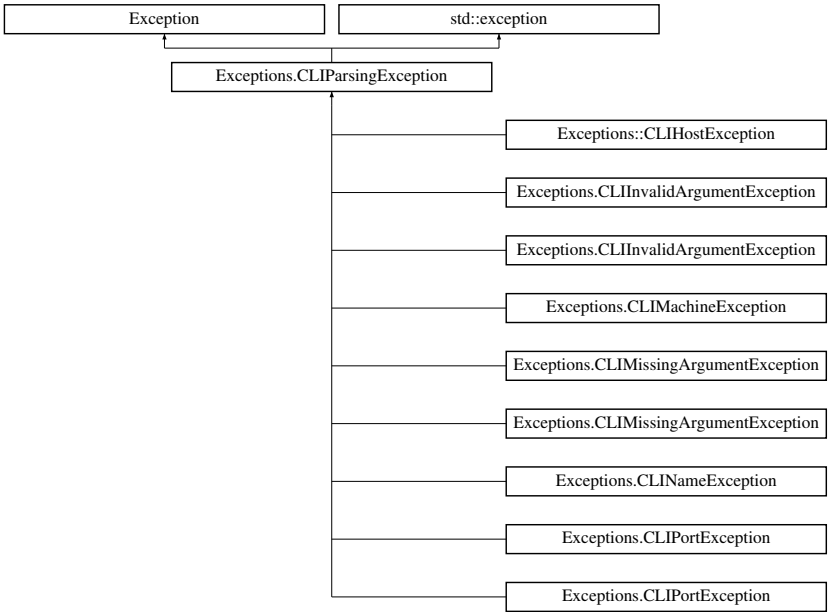
Reimplemented from Exceptions.CLIParsingException.

The documentation for this class was generated from the following file:

- ai/src/Exceptions/Exceptions.py

6.23 Exceptions.CLIParsingException Class Reference

EPITECH PROJECT, 2025 zappy File description: Exceptions.
Inheritance diagram for Exceptions.CLIParsingException:



Public Member Functions

- **__init__** (self, str message)
- **CLIParsingException** (const std::string &message)
- const char ∗ **what** () const noexcept override

Private Attributes

- std::string **_message**

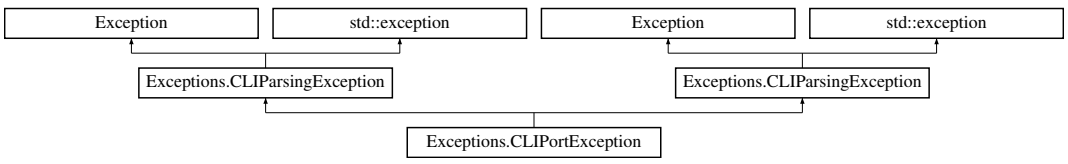
6.23.1 Detailed Description

EPITECH PROJECT, 2025 zappy File description: Exceptions.
The documentation for this class was generated from the following files:

- ai/src/Exceptions/Exceptions.py
- gui/src/Exceptions/Exceptions.hpp

6.24 Exceptions.CLIPortException Class Reference

Inheritance diagram for Exceptions.CLIPortException:



Public Member Functions

- __init__ (self, str message)
- **CLIPortException** (const std::string &message)

Public Member Functions inherited from Exceptions.CLIParsingException

- **CLIParsingException** (const std::string &message)
- const char * **what** () const noexcept override

6.24.1 Constructor & Destructor Documentation

6.24.1.1 __init__()

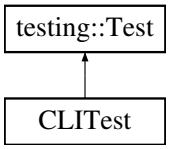
```
Exceptions.CLIPortException.__init__ (
              self,
             str message )
```

Reimplemented from Exceptions.CLIParsingException.
The documentation for this class was generated from the following files:

- ai/src/Exceptions/Exceptions.py
- gui/src/Exceptions/Exceptions.hpp

6.25 CLITest Class Reference

Inheritance diagram for CLITest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override
- char ** **createArgv** (const std::vector< std::string > &args)
- void **cleanupArgv** (char **argv, int argc)

The documentation for this class was generated from the following file:

- tests/unit/gui/CLI/CLI_test.cpp

6.26 Color32 Struct Reference

Public Attributes

- unsigned char **r**
- unsigned char **g**
- unsigned char **b**
- unsigned char **a**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.27 Constants.Colors Class Reference

Static Public Attributes

- str **BOLD** = "\033[1m"
- str **RED** = "\033[1m\033[31m"
- str **GREEN** = "\033[1m\033[32m"
- str **YELLOW** = "\033[1m\033[33m"
- str **BLUE** = "\033[1m\033[34m"
- str **MAGENTA** = "\033[1m\033[35m"
- str **CYAN** = "\033[1m\033[36m"
- str **WHITE** = "\033[1m\033[37m"
- str **RESET** = "\033[0m"

The documentation for this class was generated from the following file:

- ai/src/Config/Constants.py

6.28 command_info_t Struct Reference

Public Attributes

- char * **command**
- float **base_time**
- action_priority_t **priority**
- int(* **handler**)(player_t *, char *, zappy_t *)

The documentation for this struct was generated from the following file:

- server/include/zappy.h

6.29 command_pf_s Struct Reference

Public Attributes

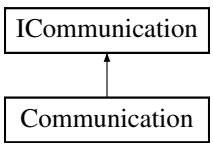
- char const * **flag**
- bool(* **checker**)(const char *, const char *, params_t *)

The documentation for this struct was generated from the following file:

- server/include/zappy.h

6.30 Communication Class Reference

Inheritance diagram for Communication:



Public Member Functions

- **Communication** (zappy::structs::Config config)
- void sendMessage (const std::string &message) override
- bool hasMessages () const override
- std::string popMessage () override
- bool isConnected () const override
- void disconnect () override

Private Member Functions

- void **setupConnection** ()
- void **createSocket** ()
- void **connectToServer** ()
- void **setupNonBlocking** ()
- void **startCommunicationThread** ()
- void **communicationLoop** ()
- bool **handlePoll** ()
- void **processWrite** ()
- void **processRead** ()
- void **parseReceivedData** ()

Private Attributes

- zappy::structs::Config **_config**
- std::thread **_thread**
- std::mutex **_mutex**
- std::condition_variable **_cv**
- std::atomic< bool > **_running**
- std::atomic< bool > **_connected**
- std::queue< std::string > **_outgoingMessages**
- std::queue< std::string > **_incomingMessages**
- std::string **_receiveBuffer**
- std::string **_sendBuffer**
- int **_socket**
- struct pollfd **_pollfd**

Static Private Attributes

- static const int **BUFFER_SIZE** = 4096
- static const char **MESSAGE_DELIMITER** = '\n'

6.30.1 Member Function Documentation

6.30.1.1 disconnect()

```
void Communication::disconnect ( )  [override], [virtual]
```

Implements ICommunication.

6.30.1.2 hasMessages()

```
bool Communication::hasMessages ( ) const  [override], [virtual]
```

Implements ICommunication.

6.30.1.3 isConnected()

```
bool Communication::isConnected ( ) const  [override], [virtual]
```

Implements ICommunication.

6.30.1.4 popMessage()

```
std::string Communication::popMessage ( )  [override], [virtual]
```

Implements ICommunication.

6.30.1.5 sendMessage()

```
void Communication::sendMessage (
            const std::string & message )  [override], [virtual]
```

Implements ICommunication.

The documentation for this class was generated from the following files:

- gui/src/Communication/Communication.hpp
- gui/src/Communication/Communication.cpp

6.31 Communication.Communication Class Reference

Public Member Functions

- **__init__** (self, str name, str host, int port)
- **__del__** (self)
- None **stopLoop** (self)
- None **loop** (self)
- dict[str, int]|None **tryGetInventory** (self, str response)
- list[dict[str, int]]|None **tryGetLook** (self, str response)
- str **handleResponse** (self, str response)
- str **receiveData** (self)
- None **receive** (self)
- dict[str, int] **getInventory** (self)
- list[dict[str, int]] **getLook** (self)
- int **lenMessageQueue** (self)
- bool **hasMessages** (self)
- tuple[int, str] **getLastMessage** (self)
- int **lenResponseQueue** (self)
- bool **hasResponses** (self)
- None **addResponse** (self, str response)
- str **getLastResponse** (self)
- int **lenPendingQueue** (self)
- bool **hasPendingCommands** (self)
- int **lenRequestQueue** (self)
- bool **hasRequests** (self)
- bool **playerIsDead** (self)
- **connectToServer** (self)
- None **sendCommand** (self, str message)
- **sendForward** (self)
- **sendRight** (self)
- **sendLeft** (self)
- None **sendLook** (self)
- None **sendInventory** (self)
- **sendBroadcast** (self, str message)
- None **sendGetConnectNbr** (self)
- **sendFork** (self)
- **sendEject** (self)
- **sendTakeObject** (self, str object_name)
- **sendSetObject** (self, str object_name)
- **sendIncantation** (self)

Public Attributes

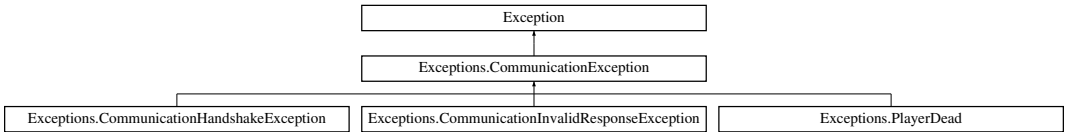
- **name**
- **host**
- **port**
- **socket**
- **mutex**
- **logger**
- **playerDead**
- **requestQueue**
- **lastInventory**
- **lastLook**
- **responseBuffer**
- **pendingQueue**
- **messageQueue**
- **responseQueue**

The documentation for this class was generated from the following file:

- ai/src/Communication/Communication.py

6.32 Exceptions.CommunicationException Class Reference

Inheritance diagram for Exceptions.CommunicationException:



Public Member Functions

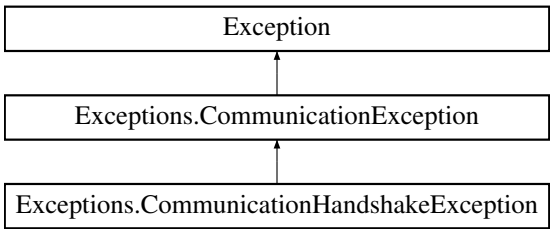
- **__init__** (self, str message)

The documentation for this class was generated from the following file:

- ai/src/Exceptions/Exceptions.py

6.33 Exceptions.CommunicationHandshakeException Class Reference

Inheritance diagram for Exceptions.CommunicationHandshakeException:



Public Member Functions

- __init__ (self, str message)

6.33.1 Constructor & Destructor Documentation

6.33.1.1 __init__()

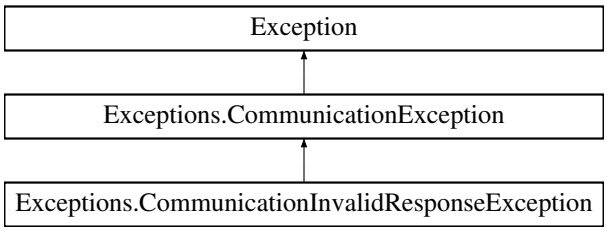
```
Exceptions.CommunicationHandshakeException.__init__ (
              self,
             str message )
```

Reimplemented from Exceptions.CommunicationException.
The documentation for this class was generated from the following file:

- ai/src/Exceptions/Exceptions.py

6.34 Exceptions.CommunicationInvalidResponseException Class Reference

Inheritance diagram for Exceptions.CommunicationInvalidResponseException:



Public Member Functions

- __init__ (self, str message)

6.34.1 Constructor & Destructor Documentation

6.34.1.1 __init__()

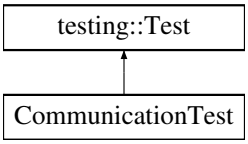
```
Exceptions.CommunicationInvalidResponseException.__init__ (
              self,
             str message )
```

Reimplemented from Exceptions.CommunicationException.
The documentation for this class was generated from the following file:

- ai/src/Exceptions/Exceptions.py

6.35 CommunicationTest Class Reference

Inheritance diagram for CommunicationTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override
- zappy::structs::Config **createValidConfig** ()

Protected Attributes

- std::unique_ptr< MockServer > **mockServer**

Static Protected Attributes

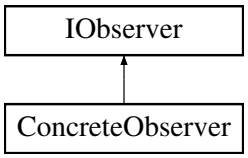
- static const int **TEST_PORT** = 9876

The documentation for this class was generated from the following file:

- tests/unit/gui/Communication/Communication_test.cpp

6.36 ConcreteObserver Class Reference

Inheritance diagram for ConcreteObserver:



Public Member Functions

- **MOCK_METHOD** (void, update,(),(override))
- **MOCK_METHOD** (void, onGameEvent,(GameEventType eventType, const std::string &teamName),(override))

Public Member Functions inherited from IObserver

- virtual void **update** ()=0
- virtual void **onGameEvent** (GameEventType eventType, const std::string &teamName)

The documentation for this class was generated from the following file:

- tests/unit/gui/Observer/IObserver_test.cpp

6.37 zappy::structs::Config Struct Reference

Public Attributes

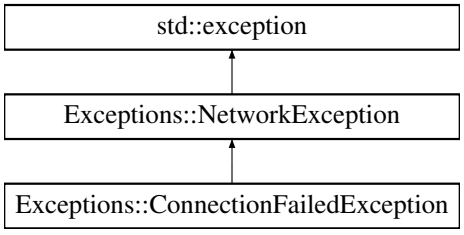
- int **port**
- std::string **hostname**

The documentation for this struct was generated from the following file:

- gui/src/Utils/Constants.hpp

6.38 Exceptions::ConnectionFailedException Class Reference

Inheritance diagram for Exceptions::ConnectionFailedException:



Public Member Functions

- **ConnectionFailedException** (const std::string &message)

Public Member Functions inherited from Exceptions::NetworkException

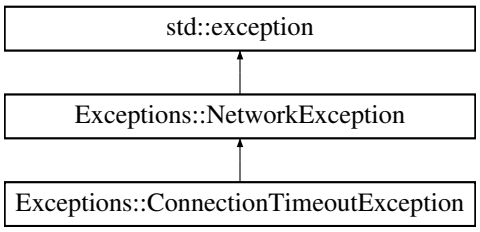
- **NetworkException** (const std::string &message)
- const char * **what** () const noexcept override

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.39 Exceptions::ConnectionTimeoutException Class Reference

Inheritance diagram for Exceptions::ConnectionTimeoutException:



Public Member Functions

- **ConnectionTimeoutException** (const std::string &message)

Public Member Functions inherited from Exceptions::NetworkException

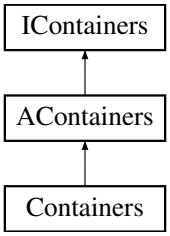
- **NetworkException** (const std::string &message)
- const char * **what** () const noexcept override

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.40 Containers Class Reference

Inheritance diagram for Containers:



Public Member Functions

- **Containers** (std::shared_ptr< IDisplay > display, std::shared_ptr< IAudio > audio, float x, float y, float width, float height, Color32 backgroundColor={40, 40, 40, 200})
- void draw () override
- void update () override

- void **setBackgroundColor** (Color32 color)
- bool **addElement** (const std::string &id, std::shared_ptr< IUIElement > element)
- std::shared_ptr< IUIElement > **getElement** (const std::string &id) const
- bool **removeElement** (const std::string &id)
- std::shared_ptr< Button > **addButton** (const std::string &id, float x, float y, float width, float height, const std::string &text, std::function< void()> callback)
- std::shared_ptr< Button > **addButton** (const std::string &id, float x, float y, float width, float height, const std::string &text, std::function< void()> callback, Color32 normalColor, Color32 hoverColor, Color32 pressedColor, Color32 textColor)
- std::shared_ptr< Text > **addText** (const std::string &id, float x, float y, const std::string &text, float fontSize=20.0f, Color32 color=CBLACK)
- std::shared_ptr< Slider > **addSlider** (const std::string &id, float x, float y, float width, float height, float minValue, float maxValue, float initialValue, const std::string &text, std::function< void(float)> onValueChanged)
- std::shared_ptr< Slider > **addSliderPercent** (const std::string &id, float xPercent, float yPercent, float widthPercent, float heightPercent, float minValue, float maxValue, float initialValue, const std::string &text, std::function< void(float)> onValueChanged)
- void **clearElements** ()
- void **handleResize** (int oldWidth, int oldHeight, int newWidth, int newHeight)
- std::shared_ptr< Button > **addButtonPercent** (const std::string &id, float xPercent, float yPercent, float widthPercent, float heightPercent, const std::string &text, std::function< void()> callback)
- std::shared_ptr< Button > **addButtonPercent** (const std::string &id, float xPercent, float yPercent, float widthPercent, float heightPercent, const std::string &text, std::function< void()> callback, Color32 normalColor, Color32 hoverColor, Color32 pressedColor, Color32 textColor)
- std::shared_ptr< Text > **addTextPercent** (const std::string &id, float xPercent, float yPercent, const std::string &text, float fontSizePercent=5.0f, Color32 color=CBLACK)
- std::shared_ptr< Image > **addImage** (const std::string &id, float x, float y, float width, float height, const std::string &imagePath)
- std::shared_ptr< Image > **addImage** (const std::string &id, float x, float y, float width, float height, const std::string &imagePath, Color32 tint)
- std::shared_ptr< Image > **addImagePercent** (const std::string &id, float xPercent, float yPercent, float widthPercent, float heightPercent, const std::string &imagePath)
- std::shared_ptr< Image > **addImagePercent** (const std::string &id, float xPercent, float yPercent, float widthPercent, float heightPercent, const std::string &imagePath, Color32 tint)
- std::shared_ptr< ImageButton > **addImageButton** (const std::string &id, float x, float y, float width, float height, const std::string &imagePath, std::function< void()> callback)
- std::shared_ptr< ImageButton > **addImageButton** (const std::string &id, float x, float y, float width, float height, const std::string &imagePath, std::function< void()> callback, Color32 tint)
- std::shared_ptr< ImageButton > **addImageButtonPercent** (const std::string &id, float xPercent, float yPercent, float widthPercent, float heightPercent, const std::string &imagePath, std::function< void()> callback)
- std::shared_ptr< ImageButton > **addImageButtonPercent** (const std::string &id, float xPercent, float yPercent, float widthPercent, float heightPercent, const std::string &imagePath, std::function< void()> callback, Color32 tint)
- std::shared_ptr< Checkbox > **addCheckbox** (const std::string &id, float x, float y, float width, float height, bool initialValue, std::function< void(bool)> callback)
- std::shared_ptr< Checkbox > **addCheckboxPercent** (const std::string &id, float xPercent, float yPercent, float widthPercent, float heightPercent, bool initialValue, std::function< void(bool)> callback)
- float **getWidth** () const
- float **getHeight** () const

Public Member Functions inherited from AContainers

- **AContainers** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- void setSize (float width, float height) override
- FloatRect getBounds () const override

- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- RelativePosition **getRelativePosition** () const
- void **updatePositionFromRelative** ()
- float **getWidth** () const
- float **getHeight** () const

Private Attributes

- std::shared_ptr< IAudio > **_audio**
- std::unordered_map< std::string, std::shared_ptr< IUIElement > > **_elements**

Additional Inherited Members

Protected Attributes inherited from AContainers

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- RelativePosition **_relativePos**
- Color32 **_backgroundColor**
- bool **_visible**
- bool **_hasBackground**

6.40.1 Member Function Documentation

6.40.1.1 draw()

```
void Containers::draw ( )  [override], [virtual]
```

Implements IContainers.

6.40.1.2 update()

```
void Containers::update ( )  [override], [virtual]
```

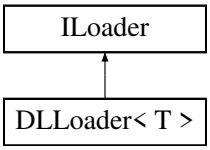
Implements IContainers.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Containers/Containers.hpp
- gui/src/Graphic/HUD/Containers/Containers.cpp

6.41 DLLoader< T > Class Template Reference

Inheritance diagram for DLLoader< T >:



Public Member Functions

- void * getHandler () const override
- void * Open (const char *path, int flag=RTLD_LAZY) override
- void * Symbol (const char *symbolName) override
- T **getSymbol** (const char *symbolName)
- int Close () override
- const char * Error () override

Private Attributes

- void * **_handler** = nullptr

6.41.1 Member Function Documentation

6.41.1.1 Close()

```
template<typename T >
int DLLoader< T >::Close ( )  [inline], [override], [virtual]
```

Implements ILoader.

6.41.1.2 Error()

```
template<typename T >
const char * DLLoader< T >::Error ( )  [inline], [override], [virtual]
```

Implements ILoader.

6.41.1.3 getHandler()

```
template<typename T >
void * DLLoader< T >::getHandler ( ) const  [inline], [override], [virtual]
```

Implements ILoader.

6.41.1.4 Open()

```
template<typename T >
void * DLLoader< T >::Open (
            const char * path,
            int flag = RTLD_LAZY )  [inline], [override], [virtual]
```

Implements ILoader.

6.41.1.5 Symbol()

```
template<typename T >
void * DLLoader< T >::Symbol (
            const char * symbolName )  [inline], [override], [virtual]
```

Implements ILoader.

The documentation for this class was generated from the following file:

- gui/src/DLLoader/DLLoader.hpp

6.42 zappy::structs::Egg Struct Reference

Public Member Functions

- **Egg** (int _eggNumber=0, int _playerNumber=0, int _x=0, int _y=0, bool _hatched=false, const std::string &_teamName="")

Public Attributes

- int **eggNumber**
- int **playerNumber**
- int **x**
- int **y**
- bool **hatched**
- std::string **teamName**

The documentation for this struct was generated from the following file:

- gui/src/Utils/Constants.hpp

6.43 egg_s Struct Reference

Public Attributes

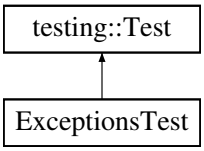
- int **id**
- int **posX**
- int **posY**
- char * **teamName**
- int **idLayer**
- bool **isHatched**
- struct egg_s * **next**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.44 ExceptionsTest Class Reference

Inheritance diagram for ExceptionsTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

The documentation for this class was generated from the following file:

- tests/unit/gui/Exceptions/Exceptions_test.cpp

6.45 FloatRect Struct Reference

Public Attributes

- float **x**
- float **y**
- float **width**
- float **height**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.46 game_s Struct Reference

Public Attributes

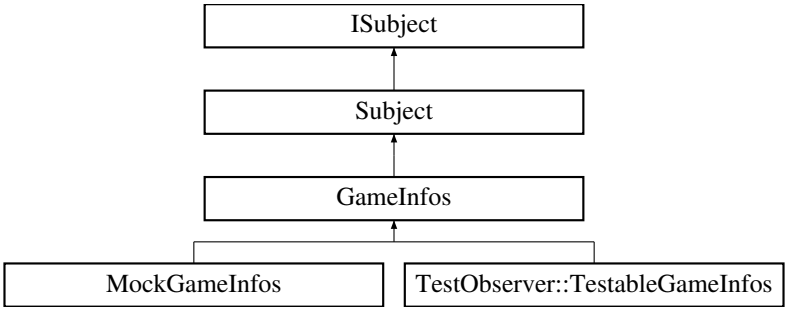
- team_t * **teams**
- map_t * **map**
- bool **won**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.47 GameInfos Class Reference

Inheritance diagram for GameInfos:



Public Member Functions

- **GameInfos** (std::shared_ptr< ICommunication > communication)
- void **setAudio** (std::shared_ptr< IAudio > audio)
- void **setCurrentCameraMode** (zappy::gui::CameraMode cameraMode)
- void **setCurrentPlayerFocus** (int playerId)
- void **setPerformanceMode** (bool performanceMode)
- void **setMapSize** (int width, int height)
- std::pair< int, int > **getMapSize** () const
- void **setTimeUnit** (int timeUnit, bool sendToServer=false)
- int **getTimeUnit** () const
- void **updateTile** (const zappy::structs::Tile tile)
- const zappy::structs::Tile **getTile** (int x, int y) const
- const zappy::structs::Tile & **getTileRef** (int x, int y) const
- void **initializeTileMatrix** ()
- void **updateTeamName** (const std::string &teamName)
- const std::vector< std::string > **getTeamNames** () const
- void **setTeamVisibility** (const std::string &teamName, bool visible)
- bool **isTeamVisible** (const std::string &teamName) const
- const std::unordered_map< std::string, bool > **getTeamVisibilities** () const
- void **setObjectVisibility** (const std::string &objectType, bool visible)
- bool **isObjectVisible** (const std::string &objectType) const
- const std::unordered_map< std::string, bool > **getObjectVisibilities** () const
- Color32 **getTeamColor** (const std::string &teamName)
- void **addPlayer** (const zappy::structs::Player player)
- void **killPlayer** (int playerNumber)
- void **updatePlayerPosition** (int playerNumber, int x, int y)
- void **updatePlayerOrientation** (int playerNumber, int orientation)
- void **updatePlayerLevel** (int playerNumber, int level)
- void **updatePlayerInventory** (int playerNumber, const zappy::structs::Inventory inventory)
- void **updatePlayerExpulsion** (int playerNumber)
- void **updatePlayerDeath** (int playerNumber)
- void **updatePlayerResourceAction** (int playerNumber, int resourceId, bool isCollecting)
- void **updatePlayerFork** (int playerNumber)
- const std::vector< zappy::structs::Player > **getPlayers** () const
- const zappy::structs::Player **getPlayer** (int playerNumber) const
- void **addPlayerBroadcast** (int playerNumber, const std::string &message)
- const std::vector< std::pair< int, std::string > > **getPlayersBroadcasting** ()
- void **addIncantation** (const zappy::structs::Incantation incantation)
- void **removeIncantation** (int x, int y, int result)

- const std::vector< zappy::structs::Incantation > **getIncantations** ()
- void **addEgg** (const zappy::structs::Egg egg)
- void **updateEggHatched** (int eggNumber)
- void **updateEggDeath** (int eggNumber)
- const std::vector< zappy::structs::Egg > **getEggs** () const
- void **setGameOver** (const std::string &winningTeam)
- void **playDefeatSound** (const std::string &teamName)
- std::pair< bool, std::string > **isGameOver** () const
- void **addServerMessage** (const std::string &message)
- const std::vector< std::string > **getServerMessages** () const
- void **securityActualisation** ()
- void **incrementPlayerLevel** (int playerNumber)
- void **decrementPlayerLevel** (int playerNumber)
- void **incrementPlayerInventoryItem** (int playerNumber, int resourceId)
- void **decrementPlayerInventoryItem** (int playerNumber, int resourceId)
- void **incrementTileInventoryItem** (int x, int y, int resourceId)
- void **decrementTileInventoryItem** (int x, int y, int resourceId)
- void **updateResourceTotals** ()
- int **getTotalResource** (const std::string &resourceName)
- int **getTotalFood** ()
- int **getTotalEggs** () const
- int **getTotalLinemate** ()
- int **getTotalDeraumere** ()
- int **getTotalSibur** ()
- int **getTotalMendiane** ()
- int **getTotalPhiras** ()
- int **getTotalThystame** ()

Public Member Functions inherited from Subject

- void addObserver (std::shared_ptr< IObserver > observer) override
- void removeObserver (std::shared_ptr< IObserver > observer) override
- void notifyObservers () override
- void notifyGameEvent (GameEventType eventType, const std::string &teamName)

Private Member Functions

- void **notifyStateChange** ()

Private Attributes

- int **_mapWidth**
- int **_mapHeight**
- int **_timeUnit**
- std::vector< std::vector< zappy::structs::Tile > > **_tileMatrix**
- bool **_matrixInitialized**
- std::vector< std::string > **_teamNames**
- std::unordered_map< std::string, bool > **_teamVisibilities**
- std::unordered_map< std::string, Color32 > **_teamColors**
- std::unordered_map< std::string, bool > **_objectVisibilities**
- std::vector< Color32 > **_colors**
- int **_colorIndex** = 0
- std::vector< zappy::structs::Player > **_players**
- std::vector< std::tuple< int, std::string, std::chrono::steady_clock::time_point > > **_playersBroadcasting**
- std::vector< zappy::structs::Incantation > **_incantations**
- std::vector< zappy::structs::Egg > **_eggs**

- std::vector< std::string > **_serverMessages**
- bool **_gameOver**
- std::string **_winningTeam**
- bool **_victorySoundPlayed**
- std::mutex **_dataMutex**
- std::shared_ptr< ICommunication > **_communication**
- std::shared_ptr< IAudio > **_audio**
- zappy::gui::CameraMode **_currentCameraMode**
- int **_currentPlayerFocus**
- std::unordered_map< std::string, int > **_resourceTotals**
- bool **_resourceTotalsNeedUpdate** = true
- bool **_performanceMode** = false

Additional Inherited Members

Protected Attributes inherited from ISubject

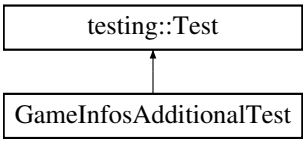
- std::vector< std::weak_ptr< IObserver > > **_observers**

The documentation for this class was generated from the following files:

- gui/src/Game/GameInfos.hpp
- gui/src/Game/GameInfos.cpp

6.48 GameInfosAdditionalTest Class Reference

Inheritance diagram for GameInfosAdditionalTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

Protected Attributes

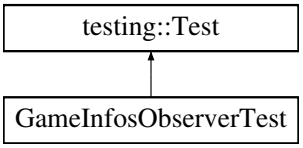
- std::unique_ptr< GameInfos > **gameInfos**
- std::shared_ptr< testing::NiceMock< MockCommunication > > **mockCommunication**
- std::shared_ptr< testing::NiceMock< MockAudio > > **mockAudio**
- std::shared_ptr< testing::NiceMock< MockObserver > > **mockObserver**

The documentation for this class was generated from the following file:

- tests/unit/gui/Game/GameInfos_test.cpp

6.49 GameInfosObserverTest Class Reference

Inheritance diagram for GameInfosObserverTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

Protected Attributes

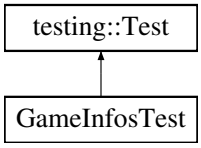
- std::unique_ptr< TestObserver::TestableGameInfos > **gameInfos**
- std::shared_ptr< testing::NiceMock< MockCommunication > > **mockCommunication**
- std::shared_ptr< testing::NiceMock< MockAudio > > **mockAudio**
- std::shared_ptr< TestObserver > **mockObserver**

The documentation for this class was generated from the following file:

- tests/unit/gui/Game/GameInfos_test.cpp

6.50 GameInfosTest Class Reference

Inheritance diagram for GameInfosTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

Protected Attributes

- std::unique_ptr< GameInfos > **gameInfos**
- std::shared_ptr< testing::NiceMock< MockCommunication > > **mockCommunication**
- std::shared_ptr< testing::NiceMock< MockAudio > > **mockAudio**

The documentation for this class was generated from the following file:

- tests/unit/gui/Game/GameInfos_test.cpp

6.51 graph_net_s Struct Reference

Public Attributes

- network_t * **network**
- bool **mapSent**
- struct graph_net_s * **next**

The documentation for this struct was generated from the following file:

- server/include/zappy.h

6.52 graphic_pf_s Struct Reference

Public Attributes

- char * **command**
- int(* **handler**)(zappy_t *zappy, graph_net_t *graphic, char *message)

The documentation for this struct was generated from the following file:

- server/include/zappy.h

6.53 GUI Class Reference

Public Member Functions

- **GUI** (std::shared_ptr< GameInfos > gameInfos, const std::string &libGraphicPath, const std::string &lib↩ AudioPath)
- void **run** ()
- void **refresh** ()
- void **handleVictory** (const std::string &teamName)
- int **getWindowWidth** () const
- int **getWindowHeight** () const
- void **setWindowWidth** (int width)
- void **setWindowHeight** (int height)
- void **switchCameraMode** (zappy::gui::CameraMode mode)
- void **switchCameraModeNext** ()
- void **setPlayerToFollow** (int playerId)
- int **getPlayerToFollow** () const
- bool **selectFirstAvailablePlayer** ()
- void **switchToNextPlayer** ()
- void **switchToPreviousPlayer** ()

Private Member Functions

- void **updateCamera** ()
- virtual void **update** ()
- virtual void **draw** ()
- virtual bool **isRunning** ()
- bool **playerExists** (int playerId) const
- void **drawSplashFrame** ()
- void **initModels** ()
- void **initPlayers** ()
- void **handlePlayerClicks** ()
- int **getPlayerUnderMouse** () const
- BoundingBox3D **getPlayerBoundingBox** (const zappy::structs::Player &player) const
- void **handleTileClicks** ()
- std::pair< int, int > **getTileUnderMouse** () const
- BoundingBox3D **getTileBoundingBox** (int x, int y) const

Static Private Member Functions

- static int **_getRandomTime** (int min, int max)

Private Attributes

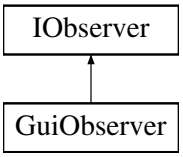
- std::string **_currentLibLoaded**
- bool **_isRunning**
- DLLoader< std::shared_ptr< IDisplay > > **_dlLoaderGraphic**
- DLLoader< std::shared_ptr< IDisplay > > **_dlLoaderAudio**
- std::shared_ptr< IDisplay > **_display**
- std::shared_ptr< GameInfos > **_gameInfos**
- std::unique_ptr< Map > **_map**
- std::unique_ptr< HUD > **_hud**
- std::unique_ptr< SplashScreen > **_splashScreen**
- std::shared_ptr< IAudio > **_audio**
- std::shared_ptr< CameraManager > **_cameraManager**
- int **_windowWidth**
- int **_windowHeight**
- zappy::gui::CameraMode **_cameraMode**
- bool **_isHUDVisible** = true
- bool **_backgroundLoaded**
- bool **_skyboxLoaded**
- int **_hoveredPlayerId**
- std::pair< int, int > **_selectedTile**
- bool **_performanceMode** = false
- bool **_showingSplashScreen** = true
- bool **_loadingComplete** = false
- std::mutex **_playerMutex**

The documentation for this class was generated from the following files:

- gui/src/Graphic/GUI.hpp
- gui/src/Graphic/GUI.cpp

6.54 GuiObserver Class Reference

Inheritance diagram for GuiObserver:



Public Member Functions

- **GuiObserver** (std::shared_ptr< GUI > gui)
- void update () override
- void onGameEvent (GameEventType eventType, const std::string &teamName) override

Private Attributes

- std::weak_ptr< GUI > **_gui**

6.54.1 Member Function Documentation

6.54.1.1 onGameEvent()

```
void GuiObserver::onGameEvent (
            GameEventType eventType,
            const std::string & teamName )  [override], [virtual]
```

Reimplemented from IObserver.

6.54.1.2 update()

```
void GuiObserver::update ( )  [override], [virtual]
```

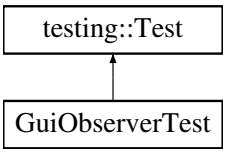
Implements IObserver.

The documentation for this class was generated from the following files:

- gui/src/Observer/GuiObserver.hpp
- gui/src/Observer/GuiObserver.cpp

6.55 GuiObserverTest Class Reference

Inheritance diagram for GuiObserverTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

Protected Attributes

- std::shared_ptr< MockGUI > **mockGui**

The documentation for this class was generated from the following file:

- tests/unit/gui/Observer/GuiObserver_test.cpp

6.56 Hash.Hash Class Reference

Public Member Functions

- **__init__** (self, str hash_key)
- bytes **simple_xor** (self, bytes data)
- str **hashMessage** (self, str message)
- str **unHashMessage** (self, str hex_message)

Public Attributes

- **key**

The documentation for this class was generated from the following file:

- ai/src/Hash/Hash.py

6.57 Help Class Reference

Public Member Functions

- **Help** (std::shared_ptr< IDisplay > display, std::shared_ptr< IAudio > audio)
- void **show** ()
- void **hide** ()
- bool **isVisible** () const
- bool **containsPoint** (float x, float y) const
- void **update** ()
- void **draw** ()
- void **handleResize** (int oldWidth, int oldHeight, int newWidth, int newHeight)

Private Member Functions

- void **initHelpContainer** ()

Private Attributes

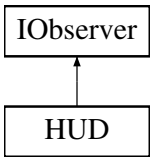
- std::shared_ptr< IDisplay > **_display**
- std::shared_ptr< IAudio > **_audio**
- std::shared_ptr< Containers > **_helpContainer**
- bool **_visible**

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Help/Help.hpp
- gui/src/Graphic/HUD/Help/Help.cpp

6.58 HUD Class Reference

Inheritance diagram for HUD:



Public Member Functions

- **HUD** (std::shared_ptr< IDisplay > display, std::shared_ptr< GameInfos > gameInfos, std::shared_ptr< IAudio > audio, std::shared_ptr< CameraManager >, bool performanceMode, std::function< void()> reset↩ CameraFunc=nullptr)
- void **draw** ()
- std::shared_ptr< Containers > **addContainer** (const std::string &id, float x, float y, float width, float height, Color32 backgroundColor={40, 40, 40, 200})
- std::shared_ptr< Containers > **getContainer** (const std::string &id) const
- bool **removeContainer** (const std::string &id)
- void **handleResize** (int oldWidth, int oldHeight, int newWidth, int newHeight)
- void **clearAllContainers** ()
- void **initDefaultLayout** (float sideWidthPercent=15.0f, float bottomHeightPercent=20.0f)
- std::shared_ptr< Containers > **getSideContainer** () const
- std::shared_ptr< Containers > **getBottomContainer** () const
- std::shared_ptr< Containers > **getSquareContainer** () const
- std::shared_ptr< Containers > **getTpsContainer** () const
- std::shared_ptr< Containers > **getSecurityContainer** () const
- std::shared_ptr< Containers > **getServerMessagesContainer** () const
- std::shared_ptr< Containers > **getMapInfoContainer** () const
- void **initExitButton** ()
- void **initSettingsButton** ()
- void **initHelpButton** ()
- void **initCameraResetButton** ()
- void **initTeamPlayersDisplay** (std::shared_ptr< GameInfos > gameInfos)
- void **updateTeamPlayersDisplay** (std::shared_ptr< GameInfos > gameInfos)
- void **initTpsSlider** (std::shared_ptr< GameInfos > gameInfos, std::shared_ptr< IDisplay > raylib, std↩ ::shared_ptr< IAudio > audio)
- void **updateTpsSlider** (std::shared_ptr< GameInfos > gameInfos)
- void **initServerMessagesDisplay** (std::shared_ptr< GameInfos > gameInfos)

- void **updateServerMessagesDisplay** (std::shared_ptr< GameInfos > gameInfos)
- void **initPlayerInventoryDisplay** (int playerId)
- void **updatePlayerInventoryDisplay** (int playerId, zappy::gui::CameraMode cameraMode)
- void **updateHelpInformationHUD** (zappy::gui::CameraMode cameraMode)
- void **clearPlayerInventoryElements** ()
- void **setSelectedTile** (int x, int y)
- void **initTileResourceDisplay** ()
- void **updateTileResourceDisplay** (int x, int y)
- void **clearTileResourceElements** ()
- void **initFpsDisplay** ()
- void **updateFpsDisplay** ()
- void **initMapInfoDisplay** ()
- void **initMapInfoButton** ()
- void **updateMapInfoDisplay** ()
- zappy::structs::Player **getPlayerById** (int playerId) const
- bool **isPlayerInIncantation** (int playerId) const
- void **setResetCameraCallback** (std::function< void()> resetFunc)
- void **displayWinMessage** (const std::string &teamName)
- void update () override
- void onGameEvent (GameEventType eventType, const std::string &teamName) override
- bool **isMouseOverHUD** () const

Private Member Functions

- void **_initHelpInformation** ()
- std::string **_camModeToText** (zappy::gui::CameraMode, bool isGamePadAvailable)
- std::string **_camKeyHelp** (zappy::gui::CameraMode, bool isGamePadAvailable)
- std::string **_mapGlobalInfo** (std::shared_ptr< GameInfos > gameInfos)
- std::shared_ptr< Containers > **createSquareContainer** (float squareSize, float sideWidthPercent)
- std::shared_ptr< Containers > **createSideContainer** (float sideYStart, float sideWidth, float sideHeight, float sideWidthPercent, float bottomHeightPercent)
- std::shared_ptr< Containers > **createBottomContainer** (int screenWidth, int screenHeight, float bottom↩ Height, float bottomHeightPercent)
- std::shared_ptr< Containers > **createTpsContainer** (int screenWidth, int screenHeight, float bottomHeight, float bottomHeightPercent)
- std::shared_ptr< Containers > **createSecurityContainer** (int screenWidth, int screenHeight, float bottom↩ Height, float bottomHeightPercent)
- std::shared_ptr< Containers > **createServerMessagesContainer** (int screenWidth, int screenHeight, float bottomHeight, float bottomHeightPercent)
- std::shared_ptr< Containers > **createMapInfoContainer** ()
- void **updateElementPositions** (std::shared_ptr< Containers > container, const std::unordered_map< std↩ ::string, float > &initialYPositions, float offset)
- std::pair< float, float > **calculateContentMetrics** (std::shared_ptr< Containers > container, const std↩ ::unordered_map< std::string, float > &initialYPositions)
- void **clearTeamDisplayElements** (std::shared_ptr< Containers > container)
- std::vector< int > **getTeamPlayerNumbers** (const std::string &teamName, const std::vector< zappy::structs::Player > &players)
- std::string **createPlayerListText** (const std::vector< int > &playerNumbers)
- void **addPlayerListText** (std::shared_ptr< Containers > container, const std::string &teamId, float yPos, const std::vector< int > &playerNumbers)
- void **addIncrementDecrementButtons** (std::shared_ptr< Containers > container, int playerId)
- void **updateTeamHoverDetection** ()
- void **createTeamDetailsContainer** ()
- void **showTeamDetailsContainer** (const std::string &teamName)
- void **hideTeamDetailsContainer** ()

Private Attributes

- std::unordered_map< std::string, std::shared_ptr< Containers > > **_containers**
- std::shared_ptr< IDisplay > **_display**
- std::shared_ptr< GameInfos > **_gameInfos**
- std::shared_ptr< IAudio > **_audio**
- std::shared_ptr< CameraManager > **_camera**
- bool **_performanceMode**
- std::shared_ptr< Help > **_help**
- std::shared_ptr< Settings > **_settings**
- std::function< void()> **_resetCameraFunc**
- bool **_showVictoryMessage**
- std::string **_winningTeam**
- Color32 **_victoryColor**
- std::pair< int, int > **_selectedTile**
- std::string **_hoveredTeam**
- std::shared_ptr< Containers > **_teamDetailsContainer**
- bool **_mapInfoButtonHovered**

6.58.1 Member Function Documentation

6.58.1.1 onGameEvent()

```
void HUD::onGameEvent (
            GameEventType eventType,
            const std::string & teamName )  [override], [virtual]
```

Reimplemented from IObserver.

6.58.1.2 update()

```
void HUD::update ( )  [override], [virtual]
```

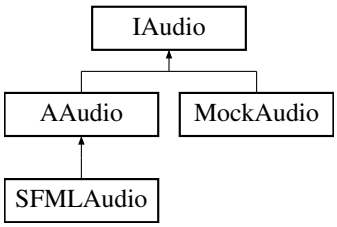
Implements IObserver.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/HUD.hpp
- gui/src/Graphic/HUD/HUD.cpp

6.59 IAudio Class Reference

Inheritance diagram for IAudio:



Public Member Functions

- virtual float **getSFXVolumeLevel** ()=0
- virtual float **getMusicVolumeLevel** ()=0
- virtual void **setSFXVolumeLevel** (float)=0
- virtual void **setMusicVolumeLevel** (float)=0
- virtual bool **loadSound** (const std::string &id, const std::string &filepath)=0

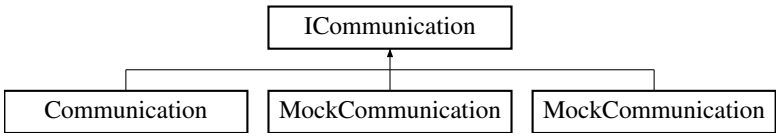
- virtual void **playMainTheme** (float volume)=0
- virtual void **playNextTheme** (float volume)=0
- virtual void **playSound** (const std::string &id, float volume)=0
- virtual void **stopSound** (const std::string &id)=0
- virtual bool **isSoundPlaying** (const std::string &id) const =0
- virtual void **setSoundLooping** (const std::string &id, bool looping)=0
- virtual void **setSoundVolume** (const std::string &id, float volume)=0

The documentation for this class was generated from the following file:

- gui/src/Audio/IAudio.hpp

6.60 ICommunication Class Reference

Inheritance diagram for ICommunication:



Public Member Functions

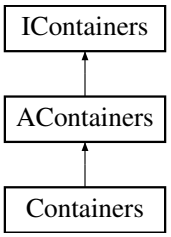
- virtual void **sendMessage** (const std::string &message)=0
- virtual bool **hasMessages** () const =0
- virtual std::string **popMessage** ()=0
- virtual bool **isConnected** () const =0
- virtual void **disconnect** ()=0

The documentation for this class was generated from the following file:

- gui/src/Communication/ICommunication.hpp

6.61 IContainers Class Reference

Inheritance diagram for IContainers:



Public Member Functions

- virtual void **draw** ()=0
- virtual void **update** ()=0
- virtual void **setPosition** (float x, float y)=0
- virtual void **setSize** (float width, float height)=0
- virtual FloatRect **getBounds** () const =0
- virtual bool **contains** (float x, float y) const =0
- virtual void **setVisible** (bool visible)=0

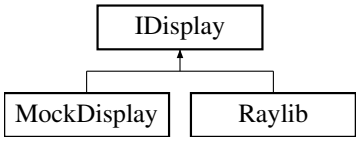
- virtual bool **isVisible** () const =0

The documentation for this class was generated from the following file:

- gui/src/Graphic/HUD/Containers/IContainers.hpp

6.62 IDisplay Class Reference

Inheritance diagram for IDisplay:



Public Member Functions

- virtual Vector2i **getMonitorSize** ()=0
- virtual Vector2i **getScreenSize** ()=0
- virtual void **initWindow** (int width, int height, std::string)=0
- virtual void **initCamera** ()=0
- virtual bool **isWindowReady** ()=0
- virtual void **setTargetFPS** (unsigned int FPS)=0
- virtual bool **isOpen** ()=0
- virtual void **closeWindow** ()=0
- virtual int **getKeyId** (enum Key)=0
- virtual bool **isKeyReleased** (int key)=0
- virtual bool **isKeyPressed** (int key)=0
- virtual bool **isKeyDown** (int key)=0
- virtual bool **isGamepadAvailable** ()=0
- virtual bool **isGamepadButtonReleased** (int key)=0
- virtual bool **isGamepadButtonPressed** (int key)=0
- virtual bool **isGamepadButtonDown** (int key)=0
- virtual bool **isMouseButtonDown** (int key)=0
- virtual bool **isMouseButtonReleased** (int key)=0
- virtual bool **isMouseButtonPressed** (int key)=0
- virtual Vector2f **getMousePosition** ()=0
- virtual void **setMousePosition** (Vector2f)=0
- virtual float **getMouseWheelMove** ()=0
- virtual float **getGamepadAxisMovement** (int key)=0
- virtual void **setCameraPosition** (Vector3f)=0
- virtual void **setCameraTarget** (Vector3f)=0
- virtual Vector2f **getMouseDelta** ()=0
- virtual float **vector3DDistanceFromCamera** (Vector3f target)=0
- virtual Vector3f **vector3SubtractFromCamera** (Vector3f target)=0
- virtual Vector3f **vector3Normalize** (Vector3f)=0
- virtual void **enableCursor** ()=0
- virtual void **disableCursor** ()=0
- virtual float **getFrameTime** ()=0
- virtual int **getFPS** ()=0
- virtual void **updateCameraFreeMode** (float camMovingSpeed, float camRotaSpeed)=0
- virtual InputType **getLastInputType** () const =0
- virtual void **updateLastInputType** ()=0
- virtual float **measureText** (const std::string &text, float fontSize) const =0

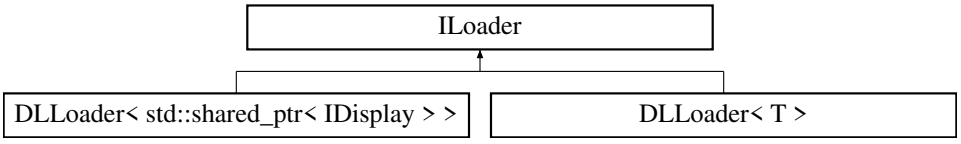
- virtual bool **checkCollisionPointRec** (Vector2f point, FloatRect rec)=0
- virtual Ray3D **getMouseRay** (Vector2f mousePosition)=0
- virtual RayCollision3D **getRayCollisionBox** (Ray3D ray, BoundingBox3D box)=0
- virtual RayCollision3D **getRayCollisionSphere** (Ray3D ray, Vector3f center, float radius)=0
- virtual bool **checkCollisionBoxes** (BoundingBox3D box1, BoundingBox3D box2)=0
- virtual Ray3D **getMouseRayFromCurrent** ()=0
- virtual BoundingBox3D **createBoundingBox** (Vector3f center, Vector3f size)=0
- virtual BoundingBox3D **createBoundingBoxFromMinMax** (Vector3f min, Vector3f max)=0
- virtual void **beginDrawing** ()=0
- virtual void **endDrawing** ()=0
- virtual void **clearBackground** (Color32)=0
- virtual void **begin3DMode** ()=0
- virtual void **end3DMode** ()=0
- virtual void **endScissorMode** ()=0
- virtual void **beginScissorMode** (IntRect)=0
- virtual bool **loadModel** (const std::string &id, const std::string &filepath, Vector3f center={0.0f, 0.0f, 0.0f})=0
- virtual void **drawCube** (Vector3f position, float width, float height, float length, Color32 color)=0
- virtual void **drawCubeWires** (Vector3f position, float width, float height, float length, Color32 color)=0
- virtual void **drawSphere** (Vector3f position, float radius, Color32 color)=0
- virtual void **drawSphereWires** (Vector3f position, float radius, int rings, int slices, Color32 color)=0
- virtual void **drawCylinder** (Vector3f position, float radiusTop, float radiusBottom, float height, int slices, Color32 color)=0
- virtual void **drawCylinderWires** (Vector3f position, float radiusTop, float radiusBottom, float height, int slices, Color32 color)=0
- virtual void **drawCylinderEx** (Vector3f startPos, Vector3f endPos, float startRadius, float endRadius, int sides, Color32 color)=0
- virtual void **drawPlane** (Vector3f position, Vector2f size, Color32 color)=0
- virtual void **drawLine3D** (Vector3f startPos, Vector3f endPos, Color32 color)=0
- virtual void **drawModelEx** (const std::string &id, Vector3f position, Vector3f rotationAxis, float rotationAngle, Vector3f scale, Color32 tint=CWHITE)=0
- virtual void **drawCircle** (float centerX, float centerY, float radius, Color32 color)=0
- virtual void **drawCircleLines** (float centerX, float centerY, float radius, Color32 color)=0
- virtual void **drawText** (const std::string &text, float x, float y, float fontSize, Color32 color)=0
- virtual void **drawTextEx** (const std::string &text, float x, float y, float fontSize, float spacing, Color32 color)=0
- virtual void **drawRectangleRec** (FloatRect rec, Color32 color)=0
- virtual bool **loadTexture** (const std::string &id, const std::string &filepath)=0
- virtual bool **loadFont** (const std::string &id, const std::string &filepath)=0
- virtual void **drawTexture** (const std::string &id, float x, float y, Color32 tint=CWHITE)=0
- virtual void **drawTextureScaled** (const std::string &id, float x, float y, float width, float height, Color32 tint=CWHITE)=0
- virtual Vector2f **getTextureSize** (const std::string &id) const =0
- virtual bool **loadSkybox** (const std::string &id, const std::string &filepath)=0
- virtual void **drawSkybox** (const std::string &id)=0
- virtual float **getTime** () const =0

The documentation for this class was generated from the following file:

- gui/src/IDisplay.hpp

6.63 ILoader Class Reference

Inheritance diagram for ILoader:



Public Member Functions

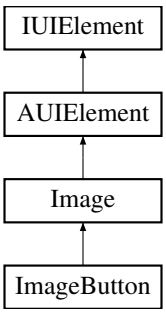
- virtual void * **Open** (const char *path, int flag)=0
- virtual void * **Symbol** (const char *symbolName)=0
- virtual int **Close** ()=0
- virtual const char * **Error** ()=0
- virtual void * **getHandler** () const =0

The documentation for this class was generated from the following file:

- gui/src/DLLoader/ILoader.hpp

6.64 Image Class Reference

Inheritance diagram for Image:



Public Member Functions

- **Image** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height, const std::string &image↩Path)
- void draw () override
- void update () override
- void **setImagePath** (const std::string &imagePath)
- std::string **getImagePath** () const
- void **setTint** (Color32 tint)
- Color32 **getTint** () const
- void setSize (float width, float height) override
- void **setMaintainAspectRatio** (bool maintain)
- bool **getMaintainAspectRatio** () const

Public Member Functions inherited from AUIElement

- **AUIElement** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- FloatRect getBounds () const override
- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- UIRelativePosition **getRelativePosition** () const

Private Member Functions

- void **loadImage** ()

Private Attributes

- std::string **_imagePath**
- Color32 **_tint**
- bool **_maintainAspectRatio**
- bool **_imageLoaded**

Additional Inherited Members

Protected Attributes inherited from AUIElement

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- UIRelativePosition **_relativePos**
- bool **_visible**

6.64.1 Member Function Documentation

6.64.1.1 draw()

```
void Image::draw ( )  [override], [virtual]
```

Implements IUIElement.

6.64.1.2 setSize()

```
void Image::setSize (
            float width,
            float height )  [override], [virtual]
```

Reimplemented from AUIElement.

6.64.1.3 update()

```
void Image::update ( )  [override], [virtual]
```

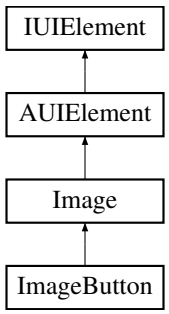
Implements IUIElement.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Image/Image.hpp
- gui/src/Graphic/HUD/Image/Image.cpp

6.65 ImageButton Class Reference

Inheritance diagram for ImageButton:



Public Member Functions

- **ImageButton** (std::shared_ptr< IDisplay > display, std::shared_ptr< IAudio > audio, float x, float y, float width, float height, const std::string &imagePath, std::function< void()> callback)

- void update () override
- void **setCallback** (std::function< void()> callback)
- std::function< void()> **getCallback** () const

Public Member Functions inherited from Image

- **Image** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height, const std::string &image↩ Path)
- void draw () override
- void **setImagePath** (const std::string &imagePath)
- std::string **getImagePath** () const
- void **setTint** (Color32 tint)
- Color32 **getTint** () const
- void setSize (float width, float height) override
- void **setMaintainAspectRatio** (bool maintain)
- bool **getMaintainAspectRatio** () const

Public Member Functions inherited from AUIElement

- **AUIElement** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- FloatRect getBounds () const override
- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- UIRelativePosition **getRelativePosition** () const

Private Attributes

- std::function< void()> **_callback**
- std::shared_ptr< IAudio > **_audio**
- bool **_isHovered**
- bool **_isPressed**

Additional Inherited Members

Protected Attributes inherited from AUIElement

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- UIRelativePosition **_relativePos**
- bool **_visible**

6.65.1 Member Function Documentation

6.65.1.1 update()

```
void ImageButton::update ( )  [override], [virtual]
```

Reimplemented from Image.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/ImageButton/ImageButton.hpp
- gui/src/Graphic/HUD/ImageButton/ImageButton.cpp

6.66 zappy::structs::Incantation Struct Reference

Public Member Functions

- **Incantation** (int _x=0, int _y=0, int _level=1, const std::vector< int > &_players={})

Public Attributes

- int **x**
- int **y**
- int **level**
- std::vector< int > **players**

The documentation for this struct was generated from the following file:

- gui/src/Utils/Constants.hpp

6.67 incantation_s Struct Reference

Public Attributes

- int **levelt_to_reach**
- int **nb_players**
- inventory_t **required_inventory**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.68 IntRect Struct Reference

Public Attributes

- int **x**
- int **y**
- int **width**
- int **height**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.69 zappy::structs::Inventory Struct Reference

Public Member Functions

- **Inventory** (int _food=0, int _linemate=0, int _deraumere=0, int _sibur=0, int _mendiane=0, int _phiras=0, int _thystame=0)

Public Attributes

- int **food**
- int **linemate**
- int **deraumere**
- int **sibur**
- int **mendiane**
- int **phiras**
- int **thystame**

The documentation for this struct was generated from the following file:

- gui/src/Utils/Constants.hpp

6.70 inventory_s Struct Reference

Public Attributes

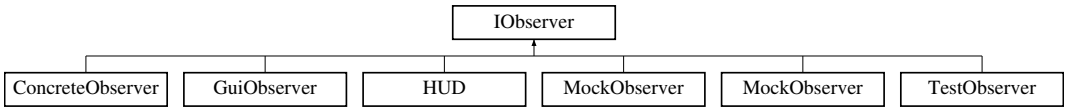
- int **nbFood**
- int **nbLinemate**
- int **nbDeraumere**
- int **nbSibur**
- int **nbMendiane**
- int **nbPhiras**
- int **nbThystame**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.71 IObserver Class Reference

Inheritance diagram for IObserver:



Public Member Functions

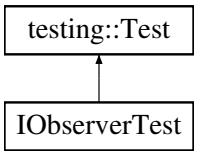
- virtual void **update** ()=0
- virtual void **onGameEvent** (GameEventType eventType, const std::string &teamName)

The documentation for this class was generated from the following file:

- gui/src/Observer/IObserver.hpp

6.72 IObserverTest Class Reference

Inheritance diagram for IObserverTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

Protected Attributes

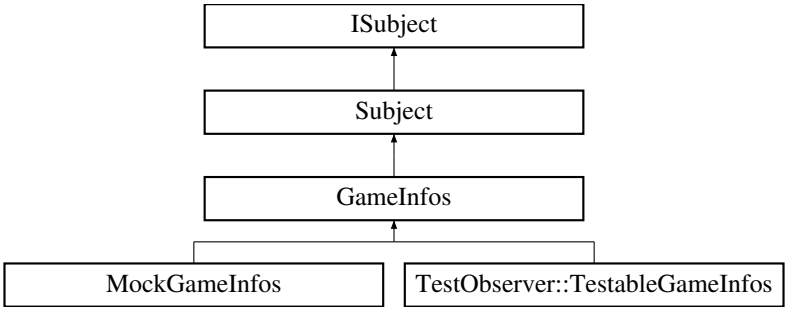
- std::shared_ptr< ConcreteObserver > **observer**

The documentation for this class was generated from the following file:

- tests/unit/gui/Observer/IObserver_test.cpp

6.73 ISubject Class Reference

Inheritance diagram for ISubject:



Public Member Functions

- virtual void **addObserver** (std::shared_ptr< IObserver > observer)=0
- virtual void **removeObserver** (std::shared_ptr< IObserver > observer)=0
- virtual void **notifyObservers** ()=0
- virtual void **notifyGameEvent** (GameEventType eventType, const std::string &teamName)=0

Protected Attributes

- std::vector< std::weak_ptr< IObserver > > **_observers**

The documentation for this class was generated from the following file:

- gui/src/Observer/ISubject.hpp

6.74 item_handler_t Struct Reference

Public Attributes

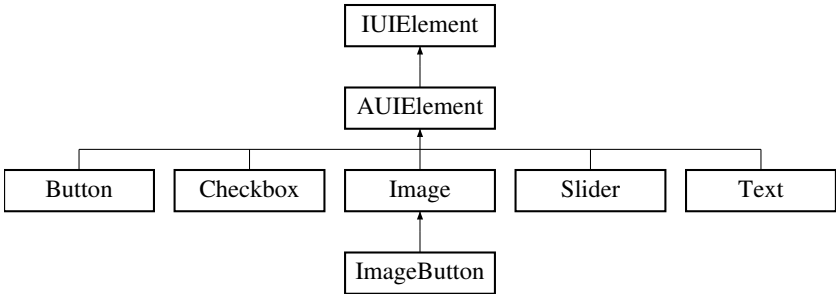
- char * **name**
- void(* **add_func**)(inventory_t *)

The documentation for this struct was generated from the following file:

- server/include/zappy.h

6.75 IUIElement Class Reference

Inheritance diagram for IUIElement:



Public Member Functions

- virtual void **draw** ()=0
- virtual void **update** ()=0
- virtual void **setPosition** (float x, float y)=0
- virtual void **setSize** (float width, float height)=0
- virtual FloatRect **getBounds** () const =0
- virtual bool **contains** (float x, float y) const =0
- virtual void **setVisible** (bool visible)=0
- virtual bool **isVisible** () const =0

The documentation for this class was generated from the following file:

- gui/src/Graphic/HUD/UIElement/IUIElement.hpp

6.76 Logger.Logger Class Reference

Public Member Functions

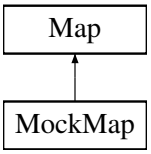
- None **error** (self, str message)
- None **info** (self, str message)
- None **help** (self, str message)
- None **debug** (self, str message)
- None **success** (self, str message)
- None **display** (self, str message)

The documentation for this class was generated from the following file:

- ai/src/Logger/Logger.py

6.77 Map Class Reference

Inheritance diagram for Map:



Public Member Functions

- **Map** (std::shared_ptr< GameInfos > gameInfos, std::shared_ptr< IDisplay > display)
- void **draw** (bool performanceMode=false)
- void **drawBroadcastingPlayers** ()
- void **drawIncantations** ()
- void **drawTile** (int x, int y, const zappy::structs::Tile &tile)
- void **drawPerformanceTile** (const zappy::structs::Tile &tile)
- void **drawRock** (int x, int y, const zappy::structs::Tile &tile)
- void **drawPerformanceRock** (int x, int y, const zappy::structs::Tile &tile)
- void **drawFood** (int x, int y, const zappy::structs::Tile &tile)
- void **drawPerformanceFood** (int x, int y, const zappy::structs::Tile &tile)
- void **drawAllPlayers** ()
- void **drawEggs** (int x, int y)
- float **getOffset** (DisplayPriority priority, int x, int y, size_t stackIndex=0)
- void **updatePlayerRotations** ()
- float **getPlayerInterpolatedRotation** (int playerId, int serverOrientation)
- void **updatePlayerPositions** ()
- Vector3f **getPlayerInterpolatedPosition** (int playerId, int serverX, int serverY)

Private Member Functions

- void **drawTorus** (const Vector3f &position, float radius, float thickness, int radialSegments, Color32 color)
- float **orientationToRotation** (int orientation)
- float **normalizeAngle** (float angle)
- float **getShortestAngleDifference** (float from, float to)
- Vector3f **calculatePlayerWorldPosition** (int x, int y)
- float **getDistance** (const Vector3f &from, const Vector3f &to)
- Vector3f **lerpVector3f** (const Vector3f &from, const Vector3f &to, float t)

Private Attributes

- std::shared_ptr< GameInfos > **_gameInfos**
- std::shared_ptr< IDisplay > **_display**
- std::unordered_map< int, std::chrono::steady_clock::time_point > **_broadcastStartTimes**
- std::unordered_map< int, PlayerRotationState > **_playerRotations**
- std::unordered_map< int, PlayerPositionState > **_playerPositions**
- std::mutex **_playerStatesMutex**
- bool **_performanceMode** = false

Static Private Attributes

- static constexpr float **BASE_HEIGHT_TILE** = 0.0f
- static constexpr float **BASE_HEIGHT_PLAYER** = 0.0f
- static constexpr float **PLAYER_HEIGHT** = 0.95f
- static constexpr float **BASE_HEIGHT_EGG** = 0.0f
- static constexpr float **EGG_HEIGHT** = 0.2f
- static constexpr float **BASE_HEIGHT_FOOD** = 0.1f
- static constexpr float **FOOD_HEIGHT** = 0.7f
- static constexpr float **BASE_HEIGHT_ROCK** = 0.1f
- static constexpr float **ROCK_HEIGHT** = 0.7f

The documentation for this class was generated from the following files:

- gui/src/Graphic/Map.hpp
- gui/src/Graphic/Map.cpp

6.78 map_t Struct Reference

Public Attributes

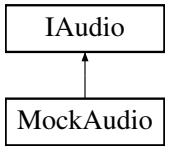
- int **width**
- int **height**
- egg_t * **currentEggs**
- inventory_t ** **tiles**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.79 MockAudio Class Reference

Inheritance diagram for MockAudio:



Public Member Functions

- **MOCK_METHOD** (float, getSFXVolumeLevel,(),(override))
- **MOCK_METHOD** (float, getMusicVolumeLevel,(),(override))
- **MOCK_METHOD** (void, setSFXVolumeLevel,(float),(override))
- **MOCK_METHOD** (void, setMusicVolumeLevel,(float),(override))
- **MOCK_METHOD** (bool, loadSound,(const std::string &id, const std::string &filepath),(override))
- **MOCK_METHOD** (void, playMainTheme,(float volume),(override))
- **MOCK_METHOD** (void, playNextTheme,(float volume),(override))
- **MOCK_METHOD** (void, playSound,(const std::string &id, float volume),(override))
- **MOCK_METHOD** (void, stopSound,(const std::string &id),(override))
- **MOCK_METHOD** (bool, isSoundPlaying,(const std::string &id),(const, override))
- **MOCK_METHOD** (void, setSoundLooping,(const std::string &id, bool looping),(override))
- **MOCK_METHOD** (void, setSoundVolume,(const std::string &id, float volume),(override))

Public Member Functions inherited from IAudio

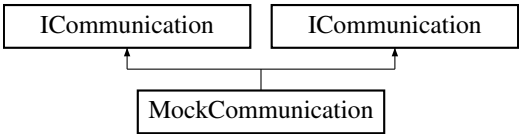
- virtual float **getSFXVolumeLevel** ()=0
- virtual float **getMusicVolumeLevel** ()=0
- virtual void **setSFXVolumeLevel** (float)=0
- virtual void **setMusicVolumeLevel** (float)=0
- virtual bool **loadSound** (const std::string &id, const std::string &filepath)=0
- virtual void **playMainTheme** (float volume)=0
- virtual void **playNextTheme** (float volume)=0
- virtual void **playSound** (const std::string &id, float volume)=0
- virtual void **stopSound** (const std::string &id)=0
- virtual bool **isSoundPlaying** (const std::string &id) const =0
- virtual void **setSoundLooping** (const std::string &id, bool looping)=0
- virtual void **setSoundVolume** (const std::string &id, float volume)=0

The documentation for this class was generated from the following file:

- tests/unit/gui/Game/GameInfos_test.cpp

6.80 MockCommunication Class Reference

Inheritance diagram for MockCommunication:



Public Member Functions

- **MOCK_METHOD** (void, sendMessage,(const std::string &message),(override))
- **MOCK_METHOD** (bool, hasMessages,(),(const, override))
- **MOCK_METHOD** (std::string, popMessage,(),(override))
- **MOCK_METHOD** (bool, isConnected,(),(const, override))
- **MOCK_METHOD** (void, disconnect,(),(override))
- **MOCK_METHOD** (void, sendMessage,(const std::string &message),(override))
- **MOCK_METHOD** (bool, hasMessages,(),(const, override))
- **MOCK_METHOD** (std::string, popMessage,(),(override))
- **MOCK_METHOD** (bool, isConnected,(),(const, override))
- **MOCK_METHOD** (void, disconnect,(),(override))

Public Member Functions inherited from ICommunication

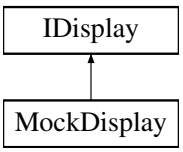
- virtual void **sendMessage** (const std::string &message)=0
- virtual bool **hasMessages** () const =0
- virtual std::string **popMessage** ()=0
- virtual bool **isConnected** () const =0
- virtual void **disconnect** ()=0

The documentation for this class was generated from the following files:

- tests/unit/gui/Client/MsgHandler_test.cpp
- tests/unit/gui/Game/GameInfos_test.cpp

6.81 MockDisplay Class Reference

Inheritance diagram for MockDisplay:



Public Member Functions

- **MOCK_METHOD** (Vector2i, getMonitorSize,(),(override))
- **MOCK_METHOD** (Vector2i, getScreenSize,(),(override))
- **MOCK_METHOD** (void, initWindow,(int width, int height, std::string title),(override))
- **MOCK_METHOD** (void, initCamera,(),(override))
- **MOCK_METHOD** (bool, isWindowReady,(),(override))
- **MOCK_METHOD** (void, setTargetFPS,(unsigned int FPS),(override))
- **MOCK_METHOD** (bool, isOpen,(),(override))
- **MOCK_METHOD** (void, closeWindow,(),(override))
- **MOCK_METHOD** (int, getKeyId,(enum Key),(override))
- **MOCK_METHOD** (bool, isKeyReleased,(int key),(override))
- **MOCK_METHOD** (bool, isKeyPressed,(int key),(override))
- **MOCK_METHOD** (bool, isKeyDown,(int key),(override))
- **MOCK_METHOD** (bool, isGamepadAvailable,(),(override))
- **MOCK_METHOD** (bool, isGamepadButtonReleased,(int key),(override))
- **MOCK_METHOD** (bool, isGamepadButtonPressed,(int key),(override))
- **MOCK_METHOD** (bool, isGamepadButtonDown,(int key),(override))
- **MOCK_METHOD** (bool, isMouseButtonDown,(int key),(override))
- **MOCK_METHOD** (bool, isMouseButtonReleased,(int key),(override))
- **MOCK_METHOD** (bool, isMouseButtonPressed,(int key),(override))
- **MOCK_METHOD** (Vector2f, getMousePosition,(),(override))
- **MOCK_METHOD** (void, setMousePosition,(Vector2f),(override))
- **MOCK_METHOD** (float, getMouseWheelMove,(),(override))
- **MOCK_METHOD** (float, getGamepadAxisMovement,(int key),(override))
- **MOCK_METHOD** (void, setCameraPosition,(Vector3f),(override))
- **MOCK_METHOD** (void, setCameraTarget,(Vector3f),(override))
- **MOCK_METHOD** (Vector2f, getMouseDelta,(),(override))
- **MOCK_METHOD** (float, vector3DDistanceFromCamera,(Vector3f target),(override))
- **MOCK_METHOD** (Vector3f, vector3SubtractFromCamera,(Vector3f target),(override))
- **MOCK_METHOD** (Vector3f, vector3Normalize,(Vector3f),(override))
- **MOCK_METHOD** (void, enableCursor,(),(override))

- **MOCK_METHOD** (void, disableCursor,(),(override))
- **MOCK_METHOD** (float, getFrameTime,(),(override))
- **MOCK_METHOD** (int, getFPS,(),(override))
- **MOCK_METHOD** (void, updateCameraFreeMode,(float camMovingSpeed, float camRotaSpeed),(override))
- **MOCK_METHOD** (InputType, getLastInputType,(),(const, override))
- **MOCK_METHOD** (void, updateLastInputType,(),(override))
- **MOCK_METHOD** (float, measureText,(const std::string &text, float fontSize),(const, override))
- **MOCK_METHOD** (bool, checkCollisionPointRec,(Vector2f point, FloatRect rec),(override))
- **MOCK_METHOD** (Ray3D, getMouseRay,(Vector2f mousePosition),(override))
- **MOCK_METHOD** (RayCollision3D, getRayCollisionBox,(Ray3D ray, BoundingBox3D box),(override))
- **MOCK_METHOD** (RayCollision3D, getRayCollisionSphere,(Ray3D ray, Vector3f center, float radius),(override))
- **MOCK_METHOD** (bool, checkCollisionBoxes,(BoundingBox3D box1, BoundingBox3D box2),(override))
- **MOCK_METHOD** (Ray3D, getMouseRayFromCurrent,(),(override))
- **MOCK_METHOD** (BoundingBox3D, createBoundingBox,(Vector3f center, Vector3f size),(override))
- **MOCK_METHOD** (BoundingBox3D, createBoundingBoxFromMinMax,(Vector3f min, Vector3f max),(override))
- **MOCK_METHOD** (void, beginDrawing,(),(override))
- **MOCK_METHOD** (void, endDrawing,(),(override))
- **MOCK_METHOD** (void, clearBackground,(Color32),(override))
- **MOCK_METHOD** (void, begin3DMode,(),(override))
- **MOCK_METHOD** (void, end3DMode,(),(override))
- **MOCK_METHOD** (void, endScissorMode,(),(override))
- **MOCK_METHOD** (void, beginScissorMode,(IntRect),(override))
- **MOCK_METHOD** (bool, loadModel,(const std::string &id, const std::string &filepath, Vector3f center),(override))
- **MOCK_METHOD** (void, drawCube,(Vector3f position, float width, float height, float length, Color32 color),(override))
- **MOCK_METHOD** (void, drawCubeWires,(Vector3f position, float width, float height, float length, Color32 color),(override))
- **MOCK_METHOD** (void, drawSphere,(Vector3f position, float radius, Color32 color),(override))
- **MOCK_METHOD** (void, drawSphereWires,(Vector3f position, float radius, int rings, int slices, Color32 color),(override))
- **MOCK_METHOD** (void, drawCylinder,(Vector3f position, float radiusTop, float radiusBottom, float height, int slices, Color32 color),(override))
- **MOCK_METHOD** (void, drawCylinderWires,(Vector3f position, float radiusTop, float radiusBottom, float height, int slices, Color32 color),(override))
- **MOCK_METHOD** (void, drawCylinderEx,(Vector3f startPos, Vector3f endPos, float startRadius, float endRadius, int sides, Color32 color),(override))
- **MOCK_METHOD** (void, drawPlane,(Vector3f position, Vector2f size, Color32 color),(override))
- **MOCK_METHOD** (void, drawLine3D,(Vector3f startPos, Vector3f endPos, Color32 color),(override))
- **MOCK_METHOD** (void, drawModelEx,(const std::string &id, Vector3f position, Vector3f rotationAxis, float rotationAngle, Vector3f scale, Color32 tint),(override))
- **MOCK_METHOD** (void, drawCircle,(float centerX, float centerY, float radius, Color32 color),(override))
- **MOCK_METHOD** (void, drawCircleLines,(float centerX, float centerY, float radius, Color32 color),(override))
- **MOCK_METHOD** (void, drawText,(const std::string &text, float x, float y, float fontSize, Color32 color),(override))
- **MOCK_METHOD** (void, drawTextEx,(const std::string &text, float x, float y, float fontSize, float spacing, Color32 color),(override))
- **MOCK_METHOD** (void, drawRectangleRec,(FloatRect rec, Color32 color),(override))
- **MOCK_METHOD** (bool, loadTexture,(const std::string &id, const std::string &filepath),(override))
- **MOCK_METHOD** (bool, loadFont,(const std::string &id, const std::string &filepath),(override))
- **MOCK_METHOD** (void, drawTexture,(const std::string &id, float x, float y, Color32 tint),(override))
- **MOCK_METHOD** (void, drawTextureScaled,(const std::string &id, float x, float y, float width, float height, Color32 tint),(override))
- **MOCK_METHOD** (Vector2f, getTextureSize,(const std::string &id),(const, override))
- **MOCK_METHOD** (bool, loadSkybox,(const std::string &id, const std::string &filepath),(override))
- **MOCK_METHOD** (void, drawSkybox,(const std::string &id),(override))
- **MOCK_METHOD** (float, getTime,(),(const, override))

Public Member Functions inherited from IDisplay

- virtual Vector2i **getMonitorSize** ()=0
- virtual Vector2i **getScreenSize** ()=0
- virtual void **initWindow** (int width, int height, std::string)=0
- virtual void **initCamera** ()=0
- virtual bool **isWindowReady** ()=0
- virtual void **setTargetFPS** (unsigned int FPS)=0
- virtual bool **isOpen** ()=0
- virtual void **closeWindow** ()=0
- virtual int **getKeyId** (enum Key)=0
- virtual bool **isKeyReleased** (int key)=0
- virtual bool **isKeyPressed** (int key)=0
- virtual bool **isKeyDown** (int key)=0
- virtual bool **isGamepadAvailable** ()=0
- virtual bool **isGamepadButtonReleased** (int key)=0
- virtual bool **isGamepadButtonPressed** (int key)=0
- virtual bool **isGamepadButtonDown** (int key)=0
- virtual bool **isMouseButtonDown** (int key)=0
- virtual bool **isMouseButtonReleased** (int key)=0
- virtual bool **isMouseButtonPressed** (int key)=0
- virtual Vector2f **getMousePosition** ()=0
- virtual void **setMousePosition** (Vector2f)=0
- virtual float **getMouseWheelMove** ()=0
- virtual float **getGamepadAxisMovement** (int key)=0
- virtual void **setCameraPosition** (Vector3f)=0
- virtual void **setCameraTarget** (Vector3f)=0
- virtual Vector2f **getMouseDelta** ()=0
- virtual float **vector3DDistanceFromCamera** (Vector3f target)=0
- virtual Vector3f **vector3SubtractFromCamera** (Vector3f target)=0
- virtual Vector3f **vector3Normalize** (Vector3f)=0
- virtual void **enableCursor** ()=0
- virtual void **disableCursor** ()=0
- virtual float **getFrameTime** ()=0
- virtual int **getFPS** ()=0
- virtual void **updateCameraFreeMode** (float camMovingSpeed, float camRotaSpeed)=0
- virtual InputType **getLastInputType** () const =0
- virtual void **updateLastInputType** ()=0
- virtual float **measureText** (const std::string &text, float fontSize) const =0
- virtual bool **checkCollisionPointRec** (Vector2f point, FloatRect rec)=0
- virtual Ray3D **getMouseRay** (Vector2f mousePosition)=0
- virtual RayCollision3D **getRayCollisionBox** (Ray3D ray, BoundingBox3D box)=0
- virtual RayCollision3D **getRayCollisionSphere** (Ray3D ray, Vector3f center, float radius)=0
- virtual bool **checkCollisionBoxes** (BoundingBox3D box1, BoundingBox3D box2)=0
- virtual Ray3D **getMouseRayFromCurrent** ()=0
- virtual BoundingBox3D **createBoundingBox** (Vector3f center, Vector3f size)=0
- virtual BoundingBox3D **createBoundingBoxFromMinMax** (Vector3f min, Vector3f max)=0
- virtual void **beginDrawing** ()=0
- virtual void **endDrawing** ()=0
- virtual void **clearBackground** (Color32)=0
- virtual void **begin3DMode** ()=0
- virtual void **end3DMode** ()=0
- virtual void **endScissorMode** ()=0
- virtual void **beginScissorMode** (IntRect)=0
- virtual bool **loadModel** (const std::string &id, const std::string &filepath, Vector3f center={0.0f, 0.0f, 0.0f})=0

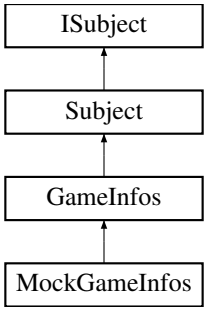
- virtual void **drawCube** (Vector3f position, float width, float height, float length, Color32 color)=0
- virtual void **drawCubeWires** (Vector3f position, float width, float height, float length, Color32 color)=0
- virtual void **drawSphere** (Vector3f position, float radius, Color32 color)=0
- virtual void **drawSphereWires** (Vector3f position, float radius, int rings, int slices, Color32 color)=0
- virtual void **drawCylinder** (Vector3f position, float radiusTop, float radiusBottom, float height, int slices, Color32 color)=0
- virtual void **drawCylinderWires** (Vector3f position, float radiusTop, float radiusBottom, float height, int slices, Color32 color)=0
- virtual void **drawCylinderEx** (Vector3f startPos, Vector3f endPos, float startRadius, float endRadius, int sides, Color32 color)=0
- virtual void **drawPlane** (Vector3f position, Vector2f size, Color32 color)=0
- virtual void **drawLine3D** (Vector3f startPos, Vector3f endPos, Color32 color)=0
- virtual void **drawModelEx** (const std::string &id, Vector3f position, Vector3f rotationAxis, float rotationAngle, Vector3f scale, Color32 tint=CWHITE)=0
- virtual void **drawCircle** (float centerX, float centerY, float radius, Color32 color)=0
- virtual void **drawCircleLines** (float centerX, float centerY, float radius, Color32 color)=0
- virtual void **drawText** (const std::string &text, float x, float y, float fontSize, Color32 color)=0
- virtual void **drawTextEx** (const std::string &text, float x, float y, float fontSize, float spacing, Color32 color)=0
- virtual void **drawRectangleRec** (FloatRect rec, Color32 color)=0
- virtual bool **loadTexture** (const std::string &id, const std::string &filepath)=0
- virtual bool **loadFont** (const std::string &id, const std::string &filepath)=0
- virtual void **drawTexture** (const std::string &id, float x, float y, Color32 tint=CWHITE)=0
- virtual void **drawTextureScaled** (const std::string &id, float x, float y, float width, float height, Color32 tint=CWHITE)=0
- virtual Vector2f **getTextureSize** (const std::string &id) const =0
- virtual bool **loadSkybox** (const std::string &id, const std::string &filepath)=0
- virtual void **drawSkybox** (const std::string &id)=0
- virtual float **getTime** () const =0

The documentation for this class was generated from the following file:

- tests/unit/gui/Camera_manager/Camera_manager_test.cpp

6.82 MockGameInfos Class Reference

Inheritance diagram for MockGameInfos:



Public Member Functions

- **MOCK_METHOD** (const std::vector< zappy::structs::Player > &, getPlayers,(),(const))
- **MOCK_METHOD** (bool, isTeamVisible,(const std::string &teamName),(const))

Public Member Functions inherited from GameInfos

- **GameInfos** (std::shared_ptr< ICommunication > communication)
- void **setAudio** (std::shared_ptr< IAudio > audio)
- void **setCurrentCameraMode** (zappy::gui::CameraMode cameraMode)
- void **setCurrentPlayerFocus** (int playerId)
- void **setPerformanceMode** (bool performanceMode)
- void **setMapSize** (int width, int height)
- std::pair< int, int > **getMapSize** () const
- void **setTimeUnit** (int timeUnit, bool sendToServer=false)
- int **getTimeUnit** () const
- void **updateTile** (const zappy::structs::Tile tile)
- const zappy::structs::Tile **getTile** (int x, int y) const
- const zappy::structs::Tile & **getTileRef** (int x, int y) const
- void **initializeTileMatrix** ()
- void **updateTeamName** (const std::string &teamName)
- const std::vector< std::string > **getTeamNames** () const
- void **setTeamVisibility** (const std::string &teamName, bool visible)
- bool **isTeamVisible** (const std::string &teamName) const
- const std::unordered_map< std::string, bool > **getTeamVisibilities** () const
- void **setObjectVisibility** (const std::string &objectType, bool visible)
- bool **isObjectVisible** (const std::string &objectType) const
- const std::unordered_map< std::string, bool > **getObjectVisibilities** () const
- Color32 **getTeamColor** (const std::string &teamName)
- void **addPlayer** (const zappy::structs::Player player)
- void **killPlayer** (int playerNumber)
- void **updatePlayerPosition** (int playerNumber, int x, int y)
- void **updatePlayerOrientation** (int playerNumber, int orientation)
- void **updatePlayerLevel** (int playerNumber, int level)
- void **updatePlayerInventory** (int playerNumber, const zappy::structs::Inventory inventory)
- void **updatePlayerExpulsion** (int playerNumber)
- void **updatePlayerDeath** (int playerNumber)
- void **updatePlayerResourceAction** (int playerNumber, int resourceId, bool isCollecting)
- void **updatePlayerFork** (int playerNumber)
- const std::vector< zappy::structs::Player > **getPlayers** () const
- const zappy::structs::Player **getPlayer** (int playerNumber) const
- void **addPlayerBroadcast** (int playerNumber, const std::string &message)
- const std::vector< std::pair< int, std::string > > **getPlayersBroadcasting** ()
- void **addIncantation** (const zappy::structs::Incantation incantation)
- void **removeIncantation** (int x, int y, int result)
- const std::vector< zappy::structs::Incantation > **getIncantations** ()
- void **addEgg** (const zappy::structs::Egg egg)
- void **updateEggHatched** (int eggNumber)
- void **updateEggDeath** (int eggNumber)
- const std::vector< zappy::structs::Egg > **getEggs** () const
- void **setGameOver** (const std::string &winningTeam)
- void **playDefeatSound** (const std::string &teamName)
- std::pair< bool, std::string > **isGameOver** () const
- void **addServerMessage** (const std::string &message)
- const std::vector< std::string > **getServerMessages** () const
- void **securityActualisation** ()
- void **incrementPlayerLevel** (int playerNumber)
- void **decrementPlayerLevel** (int playerNumber)
- void **incrementPlayerInventoryItem** (int playerNumber, int resourceId)
- void **decrementPlayerInventoryItem** (int playerNumber, int resourceId)

- void **incrementTileInventoryItem** (int x, int y, int resourceId)
- void **decrementTileInventoryItem** (int x, int y, int resourceId)
- void **updateResourceTotals** ()
- int **getTotalResource** (const std::string &resourceName)
- int **getTotalFood** ()
- int **getTotalEggs** () const
- int **getTotalLinemate** ()
- int **getTotalDeraumere** ()
- int **getTotalSibur** ()
- int **getTotalMendiane** ()
- int **getTotalPhiras** ()
- int **getTotalThystame** ()

Public Member Functions inherited from Subject

- void addObserver (std::shared_ptr< IObserver > observer) override
- void removeObserver (std::shared_ptr< IObserver > observer) override
- void notifyObservers () override
- void notifyGameEvent (GameEventType eventType, const std::string &teamName)

Additional Inherited Members

Protected Attributes inherited from ISubject

- std::vector< std::weak_ptr< IObserver > > **_observers**

The documentation for this class was generated from the following file:

- tests/unit/gui/Camera_manager/Camera_manager_test.cpp

6.83 MockGUI Class Reference

Public Member Functions

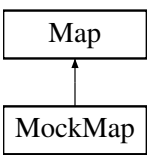
- **MOCK_METHOD** (void, refresh,())
- **MOCK_METHOD** (void, handleVictory,(const std::string &teamName))

The documentation for this class was generated from the following file:

- tests/unit/gui/Observer/GuiObserver_test.cpp

6.84 MockMap Class Reference

Inheritance diagram for MockMap:



Public Member Functions

- **MOCK_METHOD** (Vector3f, getPlayerInterpolatedPosition,(int playerNumber, int x, int y))
- **MOCK_METHOD** (float, getOffset,(DisplayPriority priority, int x, int y, size_t index))

Public Member Functions inherited from Map

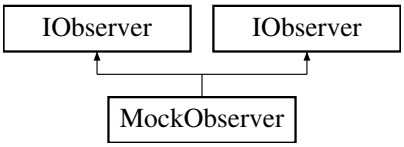
- **Map** (std::shared_ptr< GameInfos > gameInfos, std::shared_ptr< IDisplay > display)
- void **draw** (bool performanceMode=false)
- void **drawBroadcastingPlayers** ()
- void **drawIncantations** ()
- void **drawTile** (int x, int y, const zappy::structs::Tile &tile)
- void **drawPerformanceTile** (const zappy::structs::Tile &tile)
- void **drawRock** (int x, int y, const zappy::structs::Tile &tile)
- void **drawPerformanceRock** (int x, int y, const zappy::structs::Tile &tile)
- void **drawFood** (int x, int y, const zappy::structs::Tile &tile)
- void **drawPerformanceFood** (int x, int y, const zappy::structs::Tile &tile)
- void **drawAllPlayers** ()
- void **drawEggs** (int x, int y)
- float **getOffset** (DisplayPriority priority, int x, int y, size_t stackIndex=0)
- void **updatePlayerRotations** ()
- float **getPlayerInterpolatedRotation** (int playerId, int serverOrientation)
- void **updatePlayerPositions** ()
- Vector3f **getPlayerInterpolatedPosition** (int playerId, int serverX, int serverY)

The documentation for this class was generated from the following file:

- tests/unit/gui/Camera_manager/Camera_manager_test.cpp

6.85 MockObserver Class Reference

Inheritance diagram for MockObserver:



Public Member Functions

- **MOCK_METHOD** (void, update,(),(override))
- **MOCK_METHOD** (void, onGameEvent,(GameEventType, const std::string &),(override))
- **MOCK_METHOD** (void, update,(),(override))
- **MOCK_METHOD** (void, onGameEvent,(GameEventType eventType, const std::string &teamName),(override))

Public Member Functions inherited from IObserver

- virtual void **update** ()=0
- virtual void **onGameEvent** (GameEventType eventType, const std::string &teamName)

The documentation for this class was generated from the following files:

- tests/unit/gui/Game/GameInfos_test.cpp
- tests/unit/gui/Observer/Subject_test.cpp

6.86 MockServer Class Reference

Public Member Functions

- **MockServer** (int port)
- bool **start** ()
- void **stop** ()
- bool **sendToAllClients** (const std::string &message)
- bool **hasClients** () const

Private Member Functions

- void **acceptLoop** ()

Private Attributes

- int **_port**
- bool **_running**
- int **_serverSocket**
- std::thread **_thread**
- std::vector< int > **_clientSockets**

The documentation for this class was generated from the following file:

- tests/unit/gui/Communication/Communication_test.cpp

6.87 RayLibEnc::ModelData Struct Reference

Public Attributes

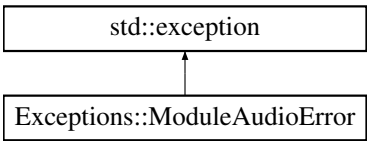
- Model **model**
- unsigned int **animationCount**
- Vector3 **center**

The documentation for this struct was generated from the following file:

- gui/src/RayLib/RaylibEnc/RayLibEnc.hpp

6.88 Exceptions::ModuleAudioError Class Reference

Inheritance diagram for Exceptions::ModuleAudioError:



Public Member Functions

- **ModuleAudioError** (const std::string &msg)
- const char * **what** () const noexcept override

Private Attributes

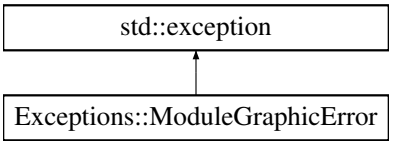
- std::string **_message** = ""

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.89 Exceptions::ModuleGraphicError Class Reference

Inheritance diagram for Exceptions::ModuleGraphicError:



Public Member Functions

- **ModuleGraphicError** (const std::string &msg)
- const char * **what** () const noexcept override

Private Attributes

- std::string **_message** = ""

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.90 MsgHandler Class Reference

Public Member Functions

- **MsgHandler** (std::shared_ptr< GameInfos > gameInfos, std::shared_ptr< ICommunication > communication)
- void **start** ()
- void **stop** ()
- void **handleMessage** (const std::string &message)

Protected Member Functions

- void **messageLoop** ()
- bool **handleWelcomeMessage** (const std::string &message)
- bool **handleMszMessage** (const std::string &message)
- bool **handleBctMessage** (const std::string &message)
- bool **handleTnaMessage** (const std::string &message)
- bool **handlePnwMessage** (const std::string &message)
- bool **handlePpoMessage** (const std::string &message)
- bool **handlePlvMessage** (const std::string &message)
- bool **handlePinMessage** (const std::string &message)
- bool **handlePexMessage** (const std::string &message)
- bool **handlePbcMessage** (const std::string &message)
- bool **handlePicMessage** (const std::string &message)
- bool **handlePieMessage** (const std::string &message)
- bool **handlePfkMessage** (const std::string &message)
- bool **handlePdrMessage** (const std::string &message)
- bool **handlePgtMessage** (const std::string &message)
- bool **handlePdiMessage** (const std::string &message)
- bool **handleEnwMessage** (const std::string &message)
- bool **handleEboMessage** (const std::string &message)
- bool **handleEdiMessage** (const std::string &message)
- bool **handleSgtMessage** (const std::string &message)
- bool **handleSstMessage** (const std::string &message)
- bool **handleSegMessage** (const std::string &message)
- bool **handleSmgMessage** (const std::string &message)
- bool **handleSucMessage** (const std::string &message)
- bool **handleSbpMessage** (const std::string &message)

Private Attributes

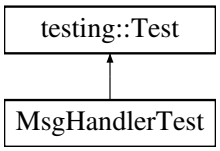
- std::thread **_thread**
- std::atomic< bool > **_running**
- std::mutex **_mutex**
- std::condition_variable **_condition**
- std::shared_ptr< GameInfos > **_gameInfos**
- std::shared_ptr< ICommunication > **_communication**
- std::mutex **_gameInfosMutex**
- std::map< std::string, std::function< bool(const std::string &)> **_messageHandlers**)

The documentation for this class was generated from the following files:

- gui/src/Client/MsgHandler.hpp
- gui/src/Client/MsgHandler.cpp

6.91 MsgHandlerTest Class Reference

Inheritance diagram for MsgHandlerTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

Protected Attributes

- std::shared_ptr< GameInfos > **gameInfos**
- std::shared_ptr< MockCommunication > **mockCommunication**
- std::unique_ptr< MsgHandler > **msgHandler**

The documentation for this class was generated from the following file:

- tests/unit/gui/Client/MsgHandler_test.cpp

6.92 network_s Struct Reference

Public Attributes

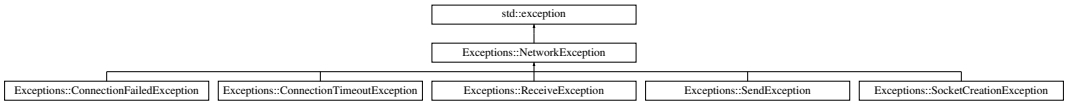
- int **fd**
- buffer_t * **readingBuffer**
- buffer_t * **writingBuffer**

The documentation for this struct was generated from the following files:

- server/include/network.h
- server/src/network/network.h

6.93 Exceptions::NetworkException Class Reference

Inheritance diagram for Exceptions::NetworkException:



Public Member Functions

- **NetworkException** (const std::string &message)
- const char * **what** () const noexcept override

Private Attributes

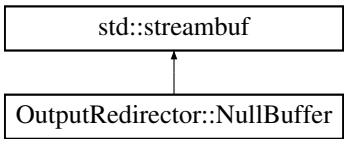
- std::string **_message**

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.94 OutputRedirector::NullBuffer Class Reference

Inheritance diagram for OutputRedirector::NullBuffer:



Protected Member Functions

- int **overflow** (int c) override

The documentation for this class was generated from the following file:

- tests/unit/gui/main_test.cpp

6.95 OutputRedirector Class Reference

Classes

- class NullBuffer

Private Attributes

- std::streambuf * **originalCout**
- std::streambuf * **originalCerr**
- NullBuffer **nullBuffer**

The documentation for this class was generated from the following file:

- tests/unit/gui/main_test.cpp

6.96 params_s Struct Reference

Public Attributes

- int **port**
- int **x**
- int **y**
- int **nb_team**
- char ** **teams**
- int **nb_client**
- int **freq**
- bool **is_debug**

The documentation for this struct was generated from the following file:

- server/include/zappy.h

6.97 Parser.Parser Class Reference

Public Member Functions

- **__init__** (self)
- **run** (self)
- **parseConfig** (self)
- **parseJsons** (self)
- **getTests** (self)

Public Attributes

- **tests_folder**
- **tests_files_names**
- **tests_files**
- **output_folder**
- **testsObjects**

The documentation for this class was generated from the following file:

- tests/functional/Parser.py

6.98 Player.Player Class Reference

Public Member Functions

- None **__init__** (self, str name, str ip, int port=4242)
- **__del__** (self)
- **__str__** (self)
- None **startComThread** (self)
- None **setMapSize** (self, int x, int y)
- None **setNbSlots** (self, int slots)
- **start** (self)
- list[(str, int)] **getNeededStonesByPriority** (self)
- bool **doesTeamHaveEnoughStones** (self)
- int **howManyTimeUnitsForIncantation** (self, int level)
- bool **enoughFoodForIncantation** (self, int level, int nbFood)
- bool **enoughFoodForGoToIncantation** (self, int level, int nbFood)
- bool **teamHasEnoughFoodForGoToIncantation** (self)
- bool **teamHasEnoughFoodForIncantation** (self)

- None **roombaAction** (self)
- None **incantationAction** (self)
- None **goToIncantationAction** (self)
- None **handleResponseInventory** (self)
- None **handleResponseLook** (self)
- None **handleResponseKO** (self)
- None **handleResponseOK** (self)
- None **handleResponseElevationUnderway** (self)
- None **handleResponseCurrentLevel** (self, str rest)
- None **handleResponseConnectNbr** (self, str response)
- None **handleCommandResponse** (self, str response)
- list[Callable[[ ], None]] **getStepsFromDirection** (self)
- None **handleMessageTeamslots** (self, int direction, str rest)
- None **handleMessageSendInventory** (self, int direction, str rest)
- None **handleMessageInventory** (self, int direction, str rest)
- **handleMessageComeIncant** (self, int direction, str rest)
- None **handleMessageDropStones** (self, int direction, str rest)
- None **handleMessageWhereAreYou** (self, int direction, str rest)
- None **handleMessageHere** (self, int direction, str rest)
- None **handleMessageLeadIncantation** (self, int direction, str rest)
- None **handleMessageGoRoombas** (self, int direction)
- None **handleMessages** (self, int direction, str message)
- None **loop** (self)

Public Attributes

- **logger**
- **is_child_process**
- **needToBroadcastInventory**
- **teamHasEnoughStones**
- **x**
- **y**
- **nbTeamSlots**
- **level**
- **look**
- **inventory**
- **inIncantation**
- **nbConnectedPlayers**
- **handleResponseInventory**
- **handleResponseLook**
- **handleResponseKO**
- **handleResponseOK**
- **handleResponseElevationUnderway**
- **handleResponseCurrentLevel**
- **handleResponseConnectNbr**
- **senderID**
- **handleMessageTeamslots**
- **handleMessageSendInventory**
- **handleMessageInventory**
- **handleMessageComeIncant**
- **handleMessageWhereAreYou**
- **handleMessageHere**
- **handleMessageDropStones**
- **handleMessageLeadIncantation**
- **handleMessageGoRoombas**
- **sentNbSlots**

Protected Member Functions

- **_child_signal_handler** (self, signum, frame)

Protected Attributes

- **_child_signal_handler**

The documentation for this class was generated from the following file:

- ai/src/Player/Player.py

6.99 zappy::structs::Player Struct Reference

Public Member Functions

- **Player** (int _number=0, int _x=0, int _y=0, int _orientation=0, int _level=1, const std::string &_teamName="", struct Inventory _inventory=Inventory())

Public Attributes

- int **number**
- int **x**
- int **y**
- int **orientation**
- int **level**
- std::string **teamName**
- struct Inventory **inventory**

The documentation for this struct was generated from the following file:

- gui/src/Utils/Constants.hpp

6.100 player_s Struct Reference

Public Attributes

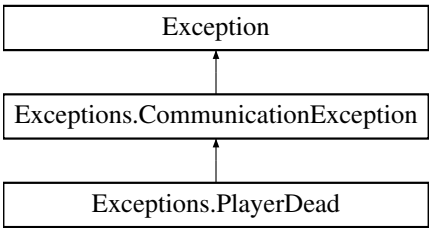
- int **id**
- network_t * **network**
- int **level**
- int **posX**
- int **posY**
- direction_t **direction**
- inventory_t * **inventory**
- char * **team**
- action_queue_t * **pending_actions**
- struct timeval **last_action_time**
- bool **is_busy**
- time_t **remaining_cooldown**
- float **time_action**
- char * **current_action**
- int **food_timer**
- time_t **last_food_check**
- struct player_s * **next**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.101 Exceptions.PlayerDead Class Reference

Inheritance diagram for Exceptions.PlayerDead:



Public Member Functions

- __init__ (self)

6.101.1 Constructor & Destructor Documentation

6.101.1.1 __init__()

```
Exceptions.PlayerDead.__init__ (
              self )
```

Reimplemented from Exceptions.CommunicationException.
The documentation for this class was generated from the following file:

- ai/src/Exceptions/Exceptions.py

6.102 zappy::gui::PlayerModelInfo Struct Reference

Public Attributes

- std::string **name**
- std::string **modelPath**
- Vector3f **center**
- Vector3f **scale**
- float **rotation**

The documentation for this struct was generated from the following file:

- gui/src/Utils/Constants.hpp

6.103 PlayerPositionState Struct Reference

Public Attributes

- Vector3f **currentPosition**
- Vector3f **targetPosition**
- bool **isMoving**
- std::chrono::steady_clock::time_point **lastUpdateTime**

The documentation for this struct was generated from the following file:

- gui/src/Graphic/Map.hpp

6.104 PlayerRotationState Struct Reference

Public Attributes

- float **currentRotation**
- float **targetRotation**
- bool **isRotating**
- std::chrono::steady_clock::time_point **lastUpdateTime**

The documentation for this struct was generated from the following file:

- gui/src/Graphic/Map.hpp

6.105 Ray3D Struct Reference

Public Attributes

- Vector3f **position**
- Vector3f **direction**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.106 RayCollision3D Struct Reference

Public Attributes

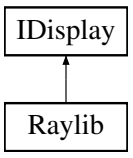
- bool **hit**
- float **distance**
- Vector3f **point**
- Vector3f **normal**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.107 Raylib Class Reference

Inheritance diagram for Raylib:



Public Member Functions

- virtual Vector2i getMonitorSize ()
- virtual Vector2i getScreenSize ()
- virtual void initWindow (int width, int height, std::string)
- virtual void initCamera ()
- virtual bool isWindowReady ()
- virtual void setTargetFPS (unsigned int FPS)
- virtual bool isOpen ()
- virtual void closeWindow ()

- virtual int getKeyId (enum Key)
- virtual bool isKeyReleased (int key)
- virtual bool isKeyPressed (int key)
- virtual bool isKeyDown (int key)
- virtual bool isGamepadAvailable ()
- virtual bool isGamepadButtonReleased (int key)
- virtual bool isGamepadButtonPressed (int key)
- virtual bool isGamepadButtonDown (int key)
- virtual bool isMouseButtonDown (int key)
- virtual bool isMouseButtonReleased (int key)
- virtual bool isMouseButtonPressed (int key)
- virtual Vector2f getMousePosition ()
- virtual void setMousePosition (Vector2f)
- virtual float getMouseWheelMove ()
- virtual float getGamepadAxisMovement (int key)
- virtual void setCameraPosition (Vector3f)
- virtual void setCameraTarget (Vector3f)
- virtual Vector2f getMouseDelta ()
- virtual float vector3DDistanceFromCamera (Vector3f target)
- virtual Vector3f vector3SubtractFromCamera (Vector3f target)
- virtual Vector3f vector3Normalize (Vector3f)
- virtual void enableCursor ()
- virtual void disableCursor ()
- virtual float getFrameTime ()
- virtual int getFPS ()
- virtual void updateCameraFreeMode (float camMovingSpeed, float camRotaSpeed)
- virtual InputType getLastInputType () const
- virtual void updateLastInputType ()
- virtual float measureText (const std::string &text, float fontSize) const
- virtual bool checkCollisionPointRec (Vector2f point, FloatRect rec)
- virtual Ray3D getMouseRay (Vector2f mousePosition)
- virtual RayCollision3D getRayCollisionBox (Ray3D ray, BoundingBox3D box)
- virtual RayCollision3D getRayCollisionSphere (Ray3D ray, Vector3f center, float radius)
- virtual bool checkCollisionBoxes (BoundingBox3D box1, BoundingBox3D box2)
- virtual Ray3D getMouseRayFromCurrent ()
- virtual BoundingBox3D createBoundingBox (Vector3f center, Vector3f size)
- virtual BoundingBox3D createBoundingBoxFromMinMax (Vector3f min, Vector3f max)
- virtual void beginScissorMode (IntRect)
- virtual void endScissorMode ()
- virtual void beginDrawing ()
- virtual void endDrawing ()
- virtual void clearBackground (Color32)
- virtual void begin3DMode ()
- virtual void end3DMode ()
- virtual bool loadModel (const std::string &id, const std::string &filepath, Vector3f center={0.0f, 0.0f, 0.0f})
- virtual void drawCube (Vector3f position, float width, float height, float length, Color32 color)
- virtual void drawCubeWires (Vector3f position, float width, float height, float length, Color32 color)
- virtual void drawSphere (Vector3f position, float radius, Color32 color)
- virtual void drawSphereWires (Vector3f position, float radius, int rings, int slices, Color32 color)
- virtual void drawCylinder (Vector3f position, float radiusTop, float radiusBottom, float height, int slices, Color32 color)
- virtual void drawCylinderWires (Vector3f position, float radiusTop, float radiusBottom, float height, int slices, Color32 color)
- virtual void drawCylinderEx (Vector3f startPos, Vector3f endPos, float startRadius, float endRadius, int sides, Color32 color)

- virtual void drawPlane (Vector3f position, Vector2f size, Color32 color)
- virtual void drawLine3D (Vector3f startPos, Vector3f endPos, Color32 color)
- virtual void drawModelEx (const std::string &id, Vector3f position, Vector3f rotationAxis, float rotationAngle, Vector3f scale, Color32 tint=CWHITE)
- virtual void drawText (const std::string &text, float x, float y, float fontSize, Color32 color)
- virtual void drawTextEx (const std::string &text, float x, float y, float fontSize, float spacing, Color32 color)
- virtual void drawCircle (float centerX, float centerY, float radius, Color32 color)
- virtual void drawCircleLines (float centerX, float centerY, float radius, Color32 color)
- virtual void drawRectangleRec (FloatRect rec, Color32 color)
- virtual bool loadTexture (const std::string &id, const std::string &filepath)
- virtual bool loadFont (const std::string &id, const std::string &filepath)
- virtual void drawTexture (const std::string &id, float x, float y, Color32 tint=CWHITE)
- virtual void drawTextureScaled (const std::string &id, float x, float y, float width, float height, Color32 tint=CWHITE)
- virtual Vector2f getTextureSize (const std::string &id) const
- virtual bool loadSkybox (const std::string &id, const std::string &filepath)
- virtual void drawSkybox (const std::string &id)
- virtual float getTime () const

Private Attributes

- std::unique_ptr< RayLibEnc > **_raylib**

6.107.1 Member Function Documentation

6.107.1.1 begin3DMode()

```
void Raylib::begin3DMode ( )  [virtual]
```

Implements IDisplay.

6.107.1.2 beginDrawing()

```
void Raylib::beginDrawing ( )  [virtual]
```

Implements IDisplay.

6.107.1.3 beginScissorMode()

```
void Raylib::beginScissorMode (
            IntRect data )  [virtual]
```

Implements IDisplay.

6.107.1.4 checkCollisionBoxes()

```
bool Raylib::checkCollisionBoxes (
            BoundingBox3D box1,
            BoundingBox3D box2 )  [virtual]
```

Implements IDisplay.

6.107.1.5 checkCollisionPointRec()

```
bool Raylib::checkCollisionPointRec (
            Vector2f point,
            FloatRect rec )  [virtual]
```

Implements IDisplay.

6.107.1.6 clearBackground()

```
void Raylib::clearBackground (
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.7 closeWindow()

```
void Raylib::closeWindow ( )  [virtual]
```
Implements IDisplay.

6.107.1.8 createBoundingBox()

```
BoundingBox3D Raylib::createBoundingBox (
            Vector3f center,
            Vector3f size )  [virtual]
```
Implements IDisplay.

6.107.1.9 createBoundingBoxFromMinMax()

```
BoundingBox3D Raylib::createBoundingBoxFromMinMax (
            Vector3f min,
            Vector3f max )  [virtual]
```
Implements IDisplay.

6.107.1.10 disableCursor()

```
void Raylib::disableCursor ( )  [virtual]
```
Implements IDisplay.

6.107.1.11 drawCircle()

```
void Raylib::drawCircle (
            float centerX,
            float centerY,
            float radius,
            Color32 color )  [virtual]
```
Implements IDisplay.

6.107.1.12 drawCircleLines()

```
void Raylib::drawCircleLines (
            float centerX,
            float centerY,
            float radius,
            Color32 color )  [virtual]
```
Implements IDisplay.

6.107.1.13 drawCube()

```
void Raylib::drawCube (
            Vector3f position,
            float width,
            float height,
            float length,
            Color32 color )  [virtual]
```
Implements IDisplay.

6.107.1.14 drawCubeWires()

```
void Raylib::drawCubeWires (
            Vector3f position,
            float width,
            float height,
            float length,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.15 drawCylinder()

```
void Raylib::drawCylinder (
            Vector3f position,
            float radiusTop,
            float radiusBottom,
            float height,
            int slices,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.16 drawCylinderEx()

```
void Raylib::drawCylinderEx (
            Vector3f startPos,
            Vector3f endPos,
            float startRadius,
            float endRadius,
            int sides,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.17 drawCylinderWires()

```
void Raylib::drawCylinderWires (
            Vector3f position,
            float radiusTop,
            float radiusBottom,
            float height,
            int slices,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.18 drawLine3D()

```
void Raylib::drawLine3D (
            Vector3f startPos,
            Vector3f endPos,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.19 drawModelEx()

```
void Raylib::drawModelEx (
            const std::string & id,
            Vector3f position,
            Vector3f rotationAxis,
            float rotationAngle,
            Vector3f scale,
            Color32 tint = CWHITE )  [virtual]
```

Implements IDisplay.

6.107.1.20 drawPlane()

```
void Raylib::drawPlane (
            Vector3f position,
```

```
            Vector2f size,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.21 drawRectangleRec()

```
void Raylib::drawRectangleRec (
            FloatRect rec,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.22 drawSkybox()

```
void Raylib::drawSkybox (
            const std::string & id )  [virtual]
```

Implements IDisplay.

6.107.1.23 drawSphere()

```
void Raylib::drawSphere (
            Vector3f position,
            float radius,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.24 drawSphereWires()

```
void Raylib::drawSphereWires (
            Vector3f position,
            float radius,
            int rings,
            int slices,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.25 drawText()

```
void Raylib::drawText (
            const std::string & text,
            float x,
            float y,
            float fontSize,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.26 drawTextEx()

```
void Raylib::drawTextEx (
            const std::string & text,
            float x,
            float y,
            float fontSize,
            float spacing,
            Color32 color )  [virtual]
```

Implements IDisplay.

6.107.1.27 drawTexture()

```
void Raylib::drawTexture (
            const std::string & id,
```

```
            float x,
            float y,
            Color32 tint = CWHITE )  [virtual]
```

Implements IDisplay.

6.107.1.28 drawTextureScaled()

```
void Raylib::drawTextureScaled (
            const std::string & id,
            float x,
            float y,
            float width,
            float height,
            Color32 tint = CWHITE )  [virtual]
```

Implements IDisplay.

6.107.1.29 enableCursor()

```
void Raylib::enableCursor ( )  [virtual]
```

Implements IDisplay.

6.107.1.30 end3DMode()

```
void Raylib::end3DMode ( )  [virtual]
```

Implements IDisplay.

6.107.1.31 endDrawing()

```
void Raylib::endDrawing ( )  [virtual]
```

Implements IDisplay.

6.107.1.32 endScissorMode()

```
void Raylib::endScissorMode ( )  [virtual]
```

Implements IDisplay.

6.107.1.33 getFPS()

```
int Raylib::getFPS ( )  [virtual]
```

Implements IDisplay.

6.107.1.34 getFrameTime()

```
float Raylib::getFrameTime ( )  [virtual]
```

Implements IDisplay.

6.107.1.35 getGamepadAxisMovement()

```
float Raylib::getGamepadAxisMovement (
            int key )  [virtual]
```

Implements IDisplay.

6.107.1.36 getKeyId()

```
int Raylib::getKeyId (
            enum Key )  [virtual]
```

Implements IDisplay.

6.107.1.37 getLastInputType()

```
InputType Raylib::getLastInputType ( ) const  [virtual]
```
Implements IDisplay.

6.107.1.38 getMonitorSize()

```
Vector2i Raylib::getMonitorSize ( )  [virtual]
```
Implements IDisplay.

6.107.1.39 getMouseDelta()

```
Vector2f Raylib::getMouseDelta ( )  [virtual]
```
Implements IDisplay.

6.107.1.40 getMousePosition()

```
Vector2f Raylib::getMousePosition ( )  [virtual]
```
Implements IDisplay.

6.107.1.41 getMouseRay()

```
Ray3D Raylib::getMouseRay (
            Vector2f mousePosition )  [virtual]
```
Implements IDisplay.

6.107.1.42 getMouseRayFromCurrent()

```
Ray3D Raylib::getMouseRayFromCurrent ( )  [virtual]
```
Implements IDisplay.

6.107.1.43 getMouseWheelMove()

```
float Raylib::getMouseWheelMove ( )  [virtual]
```
Implements IDisplay.

6.107.1.44 getRayCollisionBox()

```
RayCollision3D Raylib::getRayCollisionBox (
            Ray3D ray,
            BoundingBox3D box )  [virtual]
```
Implements IDisplay.

6.107.1.45 getRayCollisionSphere()

```
RayCollision3D Raylib::getRayCollisionSphere (
            Ray3D ray,
            Vector3f center,
            float radius )  [virtual]
```
Implements IDisplay.

6.107.1.46 getScreenSize()

```
Vector2i Raylib::getScreenSize ( )  [virtual]
```
Implements IDisplay.

6.107.1.47 getTextureSize()

```
Vector2f Raylib::getTextureSize (
            const std::string & id ) const  [virtual]
```
Implements IDisplay.

6.107.1.48 getTime()

```
float Raylib::getTime ( ) const  [virtual]
```
Implements IDisplay.

6.107.1.49 initCamera()

```
void Raylib::initCamera ( )  [virtual]
```
Implements IDisplay.

6.107.1.50 initWindow()

```
void Raylib::initWindow (
            int width,
            int height,
            std::string title )  [virtual]
```
Implements IDisplay.

6.107.1.51 isGamepadAvailable()

```
bool Raylib::isGamepadAvailable ( )  [virtual]
```
Implements IDisplay.

6.107.1.52 isGamepadButtonDown()

```
bool Raylib::isGamepadButtonDown (
            int key )  [virtual]
```
Implements IDisplay.

6.107.1.53 isGamepadButtonPressed()

```
bool Raylib::isGamepadButtonPressed (
            int key )  [virtual]
```
Implements IDisplay.

6.107.1.54 isGamepadButtonReleased()

```
bool Raylib::isGamepadButtonReleased (
            int key )  [virtual]
```
Implements IDisplay.

6.107.1.55 isKeyDown()

```
bool Raylib::isKeyDown (
            int key )  [virtual]
```
Implements IDisplay.

6.107.1.56 isKeyPressed()

```
bool Raylib::isKeyPressed (
            int key )  [virtual]
```
Implements IDisplay.

6.107.1.57 isKeyReleased()

```
bool Raylib::isKeyReleased (
            int key )  [virtual]
```
Implements IDisplay.

6.107.1.58 isMouseButtonDown()

```
bool Raylib::isMouseButtonDown (
            int key )  [virtual]
```

Implements IDisplay.

6.107.1.59 isMouseButtonPressed()

```
bool Raylib::isMouseButtonPressed (
            int key )  [virtual]
```

Implements IDisplay.

6.107.1.60 isMouseButtonReleased()

```
bool Raylib::isMouseButtonReleased (
            int key )  [virtual]
```

Implements IDisplay.

6.107.1.61 isOpen()

```
bool Raylib::isOpen ( )  [virtual]
```

Implements IDisplay.

6.107.1.62 isWindowReady()

```
bool Raylib::isWindowReady ( )  [virtual]
```

Implements IDisplay.

6.107.1.63 loadFont()

```
bool Raylib::loadFont (
            const std::string & id,
            const std::string & filepath )  [virtual]
```

Implements IDisplay.

6.107.1.64 loadModel()

```
bool Raylib::loadModel (
            const std::string & id,
            const std::string & filepath,
            Vector3f center = {0.0f, 0.0f, 0.0f} )  [virtual]
```

Implements IDisplay.

6.107.1.65 loadSkybox()

```
bool Raylib::loadSkybox (
            const std::string & id,
            const std::string & filepath )  [virtual]
```

Implements IDisplay.

6.107.1.66 loadTexture()

```
bool Raylib::loadTexture (
            const std::string & id,
            const std::string & filepath )  [virtual]
```

Implements IDisplay.

6.107.1.67 measureText()

```
float Raylib::measureText (
            const std::string & text,
            float fontSize ) const  [virtual]
```

Implements IDisplay.

6.107.1.68 setCameraPosition()

```
void Raylib::setCameraPosition (
            Vector3f pos )  [virtual]
```

Implements IDisplay.

6.107.1.69 setCameraTarget()

```
void Raylib::setCameraTarget (
            Vector3f pos )  [virtual]
```

Implements IDisplay.

6.107.1.70 setMousePosition()

```
void Raylib::setMousePosition (
            Vector2f pos )  [virtual]
```

Implements IDisplay.

6.107.1.71 setTargetFPS()

```
void Raylib::setTargetFPS (
            unsigned int FPS )  [virtual]
```

Implements IDisplay.

6.107.1.72 updateCameraFreeMode()

```
void Raylib::updateCameraFreeMode (
            float camMovingSpeed,
            float camRotaSpeed )  [virtual]
```

Implements IDisplay.

6.107.1.73 updateLastInputType()

```
void Raylib::updateLastInputType ( )  [virtual]
```

Implements IDisplay.

6.107.1.74 vector3DDistanceFromCamera()

```
float Raylib::vector3DDistanceFromCamera (
            Vector3f target )  [virtual]
```

Implements IDisplay.

6.107.1.75 vector3Normalize()

```
Vector3f Raylib::vector3Normalize (
            Vector3f vec )  [virtual]
```

Implements IDisplay.

6.107.1.76 vector3SubtractFromCamera()

```
Vector3f Raylib::vector3SubtractFromCamera (
            Vector3f target )  [virtual]
```

Implements IDisplay.

The documentation for this class was generated from the following files:

- gui/src/RayLib/Raylib.hpp
- gui/src/RayLib/Raylib.cpp

6.108 RayLibEnc Class Reference

Classes

- struct ModelData

Public Member Functions

- void **initWindow** (int width, int height, const std::string &title)
- void **closeWindow** ()
- bool **windowShouldClose** () const
- void **beginDrawing** ()
- void **endDrawing** ()
- void **clearBackground** (Color color=WHITE)
- bool **isWindowReady** () const
- int **getMonitorWidth** (int monitor) const
- int **getMonitorHeight** (int monitor) const
- void **waitTime** (float seconds) const
- void **setTargetFPS** (int fps) const
- int **getFPS** () const
- float **getFrameTime** () const
- bool **checkCollisionPointRec** (Vector2 point, Rectangle rec) const
- Ray **getMouseRay** (Vector2 mousePosition)
- RayCollision **getRayCollisionBox** (Ray ray, BoundingBox box)
- RayCollision **getRayCollisionSphere** (Ray ray, Vector3 center, float radius)
- bool **checkCollisionBoxes** (BoundingBox box1, BoundingBox box2)
- Ray **getMouseRayFromCurrent** ()
- BoundingBox **createBoundingBox** (Vector3 center, Vector3 size)
- BoundingBox **createBoundingBoxFromMinMax** (Vector3 min, Vector3 max)
- void **drawTextureRec** (Texture2D texture, Rectangle source, Vector2 position, Color tint)
- void **unloadTexture** (Texture2D texture)
- Texture2D **loadTextureFromFile** (const std::string &filepath)
- void **drawTextureEx** (Texture2D texture, Vector2 position, Color tint)
- void **drawTextureScaled** (Texture2D texture, float x, float y, float width, float height, Color tint)
- bool **hasTexture** (const std::string &id) const
- Texture2D **getTexture** (const std::string &id) const
- void **addTexture** (const std::string &id, Texture2D texture)
- bool **isMouseButtonDown** (int button) const
- bool **isMouseButtonPressed** (int button) const
- bool **isMouseButtonReleased** (int button) const
- bool **isKeyDown** (int key) const
- bool **isKeyPressed** (int key) const
- bool **isKeyReleased** (int key) const
- Vector2 **getMouseDelta** ()
- Vector2 **getMousePosition** () const
- void **setMousePosition** (int x, int y)
- void **disableCursor** ()
- void **enableCursor** ()
- int **getScreenWidth** () const
- int **getScreenHeight** () const

- float **getMouseWheelMove** () const
- bool **isGamepadAvailable** (int gamepad) const
- bool **isGamepadButtonPressed** (int gamepad, int button) const
- bool **isGamepadButtonDown** (int gamepad, int button) const
- bool **isGamepadButtonReleased** (int gamepad, int button) const
- float **getGamepadAxisMovement** (int gamepad, int axis) const
- InputType **getLastInputType** () const
- void **updateLastInputType** ()
- void **beginScissorMode** (int x, int y, int width, int height)
- void **endScissorMode** ()
- void **begin3DMode** ()
- void **end3DMode** ()
- float **vector3Distance** (Vector3 v1, Vector3 v2) const
- Vector3 **vector3Normalize** (Vector3 v) const
- Vector3 **vector3Subtract** (Vector3 v1, Vector3 v2) const
- Vector3 **vector3Add** (Vector3 v1, Vector3 v2) const
- void **initCamera** ()
- void **setCameraPosition** (Vector3 position)
- void **setCameraTarget** (Vector3 target)
- void **setCameraUp** (Vector3 up)
- void **setCameraFovy** (float fovy)
- void **setCameraProjection** (int projection)
- void **updateCamera** (int mode=CAMERA_FREE)
- void **updateCameraFreeMode** (float camMovingSpeed, float camRotaSpeed)
- Camera3D **getCamera** () const
- void **drawGrid** (int slices, float spacing)
- void **drawCube** (Vector3 position, float width, float height, float length, Color color)
- void **drawCubeWires** (Vector3 position, float width, float height, float length, Color color)
- void **drawSphere** (Vector3 position, float radius, Color color)
- void **drawSphereWires** (Vector3 position, float radius, int rings, int slices, Color color)
- void **drawCylinder** (Vector3 position, float radiusTop, float radiusBottom, float height, int slices, Color color)
- void **drawCylinderWires** (Vector3 position, float radiusTop, float radiusBottom, float height, int slices, Color color)
- void **drawCylinderEx** (Vector3 startPos, Vector3 endPos, float startRadius, float endRadius, int sides, Color color)
- void **drawPlane** (Vector3 position, Vector2 size, Color color)
- void **drawLine3D** (Vector3 startPos, Vector3 endPos, Color color)
- bool **loadModel** (const std::string &id, const std::string &filepath, Vector3 center={0.0f, 0.0f, 0.0f})
- void **drawModel** (const std::string &id, Vector3 position, float scale, Color tint=WHITE)
- void **drawModelEx** (const std::string &id, Vector3 position, Vector3 rotationAxis, float rotationAngle, Vector3 scale, Color tint=WHITE)
- void **drawModelWires** (const std::string &id, Vector3 position, float scale, Color tint=WHITE)
- void **drawModelWiresEx** (const std::string &id, Vector3 position, Vector3 rotationAxis, float rotationAngle, Vector3 scale, Color tint=WHITE)
- void **unloadModel** (const std::string &id)
- void **unloadAllModels** ()
- bool **modelExists** (const std::string &id) const
- bool **loadSkybox** (const std::string &id, const std::string &filepath)
- void **drawSkybox** (const std::string &id)
- Color **getDayNightColor** (float cycleTime)
- float **getTime** () const
- void **drawRectangleRec** (Rectangle rec, Color color)
- void **drawText** (const std::string &text, float x, float y, float fontSize, Color color)
- void **drawTextEx** (const std::string &text, float x, float y, float fontSize, float spacing, Color color)
- void **drawCircle** (float centerX, float centerY, float radius, Color color)

- void **drawCircleLines** (float centerX, float centerY, float radius, Color color)
- float **measureText** (const std::string &text, float fontSize) const
- float **measureTextEx** (const std::string &text, float fontSize, float spacing) const
- bool **loadFont** (const std::string &id, const std::string &filepath)
- void **unloadFont** (const std::string &id)
- bool **hasFontLoaded** (const std::string &id) const
- Font **getFont** (const std::string &id) const
- void **unloadAllFonts** ()

Private Member Functions

- float **getScaledFontSize** (float fontSize) const
- float **getFontSpacing** (float scaledFontSize) const
- float **getScaledSpacing** (float spacing) const

Private Attributes

- bool **_isInitialized**
- Camera3D **_camera**
- Vector2 **_previousMousePosition**
- bool **_isCursorLocked**
- InputType **_lastInputType**
- std::map< std::string, ModelData > **_models**
- std::map< std::string, Texture2D > **_textures**
- std::map< std::string, Sound > **_sounds**
- std::map< std::string, Music > **_musics**
- std::map< std::string, Font > **_fonts**

Static Private Attributes

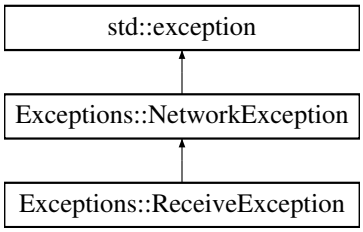
- static constexpr float **FONT_SCALE_FACTOR** = 4.0f
- static constexpr float **FONT_RENDER_SCALE** = 0.25f
- static constexpr float **FONT_SPACING_RATIO** = 0.1f

The documentation for this class was generated from the following files:

- gui/src/RayLib/RaylibEnc/RayLibEnc.hpp
- gui/src/RayLib/RaylibEnc/Raylib3dDrawing.cpp
- gui/src/RayLib/RaylibEnc/Raylib3dEnv.cpp
- gui/src/RayLib/RaylibEnc/Raylib3dModel.cpp
- gui/src/RayLib/RaylibEnc/RaylibCamera.cpp
- gui/src/RayLib/RaylibEnc/RaylibCollision3D.cpp
- gui/src/RayLib/RaylibEnc/RayLibEnc.cpp
- gui/src/RayLib/RaylibEnc/RaylibGamepad.cpp
- gui/src/RayLib/RaylibEnc/RaylibInput.cpp
- gui/src/RayLib/RaylibEnc/RaylibSkybox.cpp
- gui/src/RayLib/RaylibEnc/RaylibTextures.cpp
- gui/src/RayLib/RaylibEnc/RaylibWindow.cpp

6.109 Exceptions::ReceiveException Class Reference

Inheritance diagram for Exceptions::ReceiveException:



Public Member Functions

- **ReceiveException** (const std::string &message)

Public Member Functions inherited from Exceptions::NetworkException

- **NetworkException** (const std::string &message)
- const char * **what** () const noexcept override

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.110 RelativePosition Struct Reference

Public Attributes

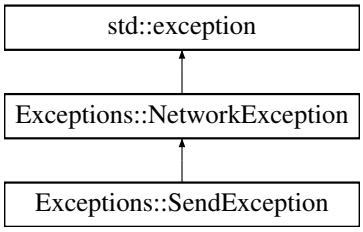
- float **xPercent**
- float **yPercent**
- float **widthPercent**
- float **heightPercent**

The documentation for this struct was generated from the following file:

- gui/src/Graphic/HUD/Containers/AContainers.hpp

6.111 Exceptions::SendException Class Reference

Inheritance diagram for Exceptions::SendException:



Public Member Functions

- **SendException** (const std::string &message)

Public Member Functions inherited from Exceptions::NetworkException

- **NetworkException** (const std::string &message)
- const char * **what** () const noexcept override

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.112 server_s Struct Reference

Public Attributes

- int **sockfd**
- int **port**
- int **backlog**
- struct pollfd **pollserver**

The documentation for this struct was generated from the following files:

- server/include/network.h
- server/src/network/network.h

6.113 Settings Class Reference

Public Member Functions

- bool **isVisible** () const
- bool **containsPoint** (float x, float y) const
- void **show** ()
- void **hide** ()
- void **update** ()
- void **draw** ()
- void **handleResize** (int oldWidth, int oldHeight, int newWidth, int newHeight)
- **Settings** (std::shared_ptr< IDisplay > display, std::shared_ptr< IAudio > audio, std::shared_ptr< CameraManager > camera, std::shared_ptr< GameInfos > gameInfos)

Private Attributes

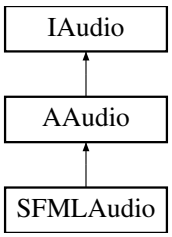
- std::shared_ptr< IDisplay > **_display**
- std::shared_ptr< IAudio > **_audio**
- std::shared_ptr< CameraManager > **_camera**
- std::shared_ptr< GameInfos > **_gameInfos**
- float **_sfxLevel**
- float **_musicLevel**
- float **_cameraMovingSpeed**
- float **_cameraRotaSpeed**
- float **_cameraZoomSpeed**
- std::shared_ptr< Containers > **_settingsContainer**
- bool **_visible**

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Settings/Settings.hpp
- gui/src/Graphic/HUD/Settings/Settings.cpp

6.114 SFMLAudio Class Reference

Inheritance diagram for SFMLAudio:



Public Member Functions

- bool loadSound (const std::string &id, const std::string &filepath)
- void playSound (const std::string &id, float volume)
- void stopSound (const std::string &id)
- bool isSoundPlaying (const std::string &id) const
- void setSoundLooping (const std::string &id, bool looping)
- void setSoundVolume (const std::string &id, float volume)

Public Member Functions inherited from AAudio

- float getSFXVolumeLevel ()
- float getMusicVolumeLevel ()
- void setSFXVolumeLevel (float)
- void setMusicVolumeLevel (float)
- void playMainTheme (float volume)
- void playNextTheme (float volume)

Private Attributes

- std::map< std::string, std::unique_ptr< sf::Music > > **_sounds**

Additional Inherited Members

Protected Attributes inherited from AAudio

- std::vector< std::string > **_musicId** = {"main_theme", "main_theme2"}
- std::vector< std::string > _sfxId
- float **_levelSFX** = 75.f
- float **_levelMusic** = 50.f
- int **_themeIndex** = 0

6.114.1 Member Function Documentation

6.114.1.1 isSoundPlaying()

```
bool SFMLAudio::isSoundPlaying (
            const std::string & id ) const  [virtual]
```

Implements IAudio.

6.114.1.2 loadSound()

```
bool SFMLAudio::loadSound (
            const std::string & id,
            const std::string & filepath )  [virtual]
```

Implements IAudio.

6.114.1.3 playSound()

```
void SFMLAudio::playSound (
            const std::string & id,
            float volume )  [virtual]
```

Implements IAudio.

6.114.1.4 setSoundLooping()

```
void SFMLAudio::setSoundLooping (
            const std::string & id,
            bool looping )  [virtual]
```

Implements IAudio.

6.114.1.5 setSoundVolume()

```
void SFMLAudio::setSoundVolume (
            const std::string & id,
            float volume )  [virtual]
```

Implements IAudio.

6.114.1.6 stopSound()

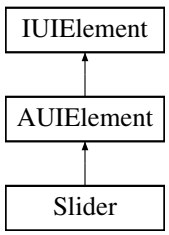
```
void SFMLAudio::stopSound (
            const std::string & id )  [virtual]
```

Implements IAudio.
The documentation for this class was generated from the following files:

- gui/src/Audio/SFML/SFMLAudio.hpp
- gui/src/Audio/SFML/SFMLAudio.cpp

6.115 Slider Class Reference

Inheritance diagram for Slider:



Public Member Functions

- **Slider** (std::shared_ptr< IDisplay > raylib, float x, float y, float width, float height, float minValue, float max↩ Value, float initialValue, const std::string &text, std::function< void(float)> onValueChanged)
- void draw () override
- void update () override
- bool **isDragging** () const
- void **setValue** (float value)
- float **getValue** () const
- void **setMinValue** (float minValue)
- void **setMaxValue** (float maxValue)
- float **getMinValue** () const
- float **getMaxValue** () const
- void **setText** (const std::string &text)

- std::string **getText** () const
- void setSize (float width, float height) override

Public Member Functions inherited from AUIElement

- **AUIElement** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- FloatRect getBounds () const override
- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- UIRelativePosition **getRelativePosition** () const

Private Member Functions

- void **updateValueFromMousePosition** (float mouseX)
- float **getHandlePosition** () const
- bool **isMouseOverHandle** (float mouseX, float mouseY) const
- bool **isMouseOverTrack** (float mouseX, float mouseY) const

Private Attributes

- float **_value**
- float **_minValue**
- float **_maxValue**
- std::string **_text**
- std::function< void(float)> **_onValueChanged**
- bool **_isDragging**
- float **_sliderTrackWidth**
- float **_sliderHandleRadius**
- Color32 **_trackColor**
- Color32 **_fillColor**
- Color32 **_handleColor**
- Color32 **_textColor**

Additional Inherited Members

Protected Attributes inherited from AUIElement

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- UIRelativePosition **_relativePos**
- bool **_visible**

6.115.1 Member Function Documentation

6.115.1.1 draw()

```
void Slider::draw ( )  [override], [virtual]
```

Implements IUIElement.

6.115.1.2 setSize()

```
void Slider::setSize (
            float width,
            float height )  [override], [virtual]
```

Reimplemented from AUIElement.

6.115.1.3 update()

```
void Slider::update ( )  [override], [virtual]
```

Implements IUIElement.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Slider/Slider.hpp
- gui/src/Graphic/HUD/Slider/Slider.cpp

6.116 Socket.Socket Class Reference

Public Member Functions

- **__init__** (self, str host, int port)
- **connect** (self)
- int **get_fd** (self)
- **send** (self, str content)
- str **receive** (self)
- **close** (self)

Protected Attributes

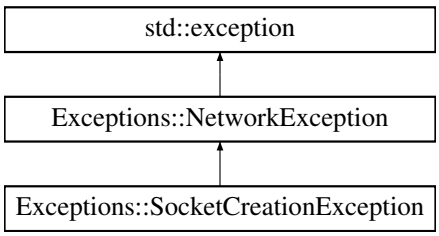
- **_host**
- **_port**
- **_address**
- **_socket**

The documentation for this class was generated from the following file:

- ai/src/Communication/Socket.py

6.117 Exceptions::SocketCreationException Class Reference

Inheritance diagram for Exceptions::SocketCreationException:



Public Member Functions

- **SocketCreationException** (const std::string &message)

Public Member Functions inherited from Exceptions::NetworkException

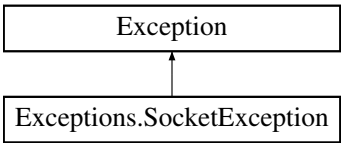
- **NetworkException** (const std::string &message)
- const char * **what** () const noexcept override

The documentation for this class was generated from the following file:

- gui/src/Exceptions/Exceptions.hpp

6.118 Exceptions.SocketException Class Reference

Inheritance diagram for Exceptions.SocketException:



Public Member Functions

- **__init__** (self, str message)

The documentation for this class was generated from the following file:

- ai/src/Exceptions/Exceptions.py

6.119 SplashScreen Class Reference

Public Member Functions

- **SplashScreen** (std::shared_ptr< IDisplay > display)
- void **show** ()
- void **update** (float deltaTime)
- void **draw** ()
- void **setLoadingProgress** (float progress)
- void **setLoadingText** (const std::string &text)
- void **finish** ()

Private Member Functions

- void **_drawBackground** ()
- void **_drawLoadingBar** ()
- void **_drawLoadingText** ()
- void **_drawZappyLogo** ()

Private Attributes

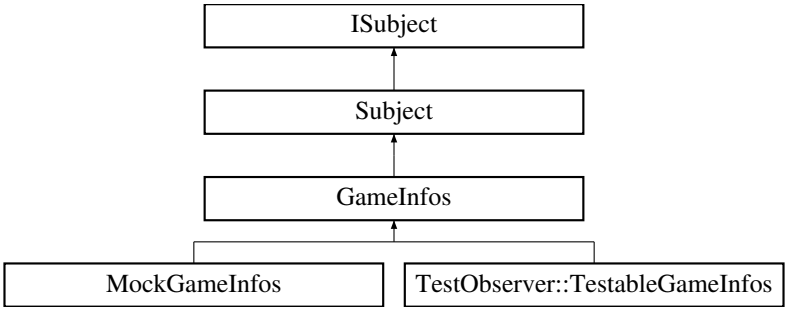
- std::shared_ptr< IDisplay > **_display**
- float **_currentTime**
- float **_fadeAlpha**
- float **_logoScale**
- float **_loadingProgress**
- std::string **_loadingText**
- bool **_finished**
- bool **_logoLoaded**
- int **_windowWidth**
- int **_windowHeight**

The documentation for this class was generated from the following files:

- gui/src/Graphic/SplashScreen.hpp
- gui/src/Graphic/SplashScreen.cpp

6.120 Subject Class Reference

Inheritance diagram for Subject:



Public Member Functions

- void addObserver (std::shared_ptr< IObserver > observer) override
- void removeObserver (std::shared_ptr< IObserver > observer) override
- void notifyObservers () override
- void notifyGameEvent (GameEventType eventType, const std::string &teamName)

Private Attributes

- std::vector< std::weak_ptr< IObserver > > **_observers**
- std::mutex **_observersMutex**

Additional Inherited Members

Protected Attributes inherited from ISubject

- std::vector< std::weak_ptr< IObserver > > **_observers**

6.120.1 Member Function Documentation

6.120.1.1 addObserver()

```
void Subject::addObserver (
            std::shared_ptr< IObserver > observer )  [override], [virtual]
```

Implements ISubject.

6.120.1.2 notifyGameEvent()

```
void Subject::notifyGameEvent (
            GameEventType eventType,
            const std::string & teamName )  [virtual]
```

Implements ISubject.

6.120.1.3 notifyObservers()

```
void Subject::notifyObservers ( )  [override], [virtual]
```

Implements ISubject.

6.120.1.4 removeObserver()

```
void Subject::removeObserver (
            std::shared_ptr< IObserver > observer )  [override], [virtual]
```

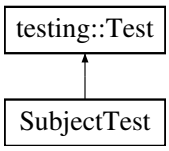
Implements ISubject.

The documentation for this class was generated from the following files:

- gui/src/Observer/Subject.hpp
- gui/src/Observer/Subject.cpp

6.121 SubjectTest Class Reference

Inheritance diagram for SubjectTest:



Protected Member Functions

- void **SetUp** () override
- void **TearDown** () override

Protected Attributes

- std::unique_ptr< Subject > **subject**
- std::shared_ptr< MockObserver > **observer1**
- std::shared_ptr< MockObserver > **observer2**
- std::shared_ptr< MockObserver > **observer3**

The documentation for this class was generated from the following file:

- tests/unit/gui/Observer/Subject_test.cpp

6.122 team_s Struct Reference

Public Attributes

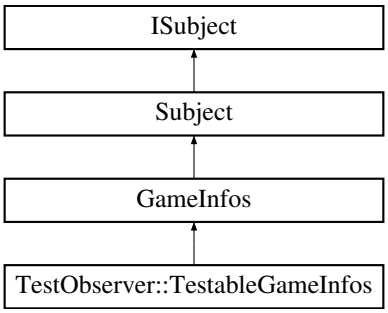
- char * **name**
- int **nbPlayers**
- int **nbPlayerAlive**
- player_t * **players**
- struct team_s * **next**

The documentation for this struct was generated from the following file:

- server/include/game.h

6.123 TestObserver::TestableGameInfos Class Reference

Inheritance diagram for TestObserver::TestableGameInfos:



Public Member Functions

- **TestableGameInfos** (std::shared_ptr< ICommunication > communication)
- void **testNotifyObservers** ()

Public Member Functions inherited from GameInfos

- **GameInfos** (std::shared_ptr< ICommunication > communication)
- void **setAudio** (std::shared_ptr< IAudio > audio)
- void **setCurrentCameraMode** (zappy::gui::CameraMode cameraMode)
- void **setCurrentPlayerFocus** (int playerId)
- void **setPerformanceMode** (bool performanceMode)
- void **setMapSize** (int width, int height)
- std::pair< int, int > **getMapSize** () const
- void **setTimeUnit** (int timeUnit, bool sendToServer=false)
- int **getTimeUnit** () const
- void **updateTile** (const zappy::structs::Tile tile)
- const zappy::structs::Tile **getTile** (int x, int y) const
- const zappy::structs::Tile & **getTileRef** (int x, int y) const
- void **initializeTileMatrix** ()
- void **updateTeamName** (const std::string &teamName)
- const std::vector< std::string > **getTeamNames** () const
- void **setTeamVisibility** (const std::string &teamName, bool visible)
- bool **isTeamVisible** (const std::string &teamName) const
- const std::unordered_map< std::string, bool > **getTeamVisibilities** () const
- void **setObjectVisibility** (const std::string &objectType, bool visible)
- bool **isObjectVisible** (const std::string &objectType) const
- const std::unordered_map< std::string, bool > **getObjectVisibilities** () const
- Color32 **getTeamColor** (const std::string &teamName)
- void **addPlayer** (const zappy::structs::Player player)
- void **killPlayer** (int playerNumber)
- void **updatePlayerPosition** (int playerNumber, int x, int y)
- void **updatePlayerOrientation** (int playerNumber, int orientation)
- void **updatePlayerLevel** (int playerNumber, int level)
- void **updatePlayerInventory** (int playerNumber, const zappy::structs::Inventory inventory)
- void **updatePlayerExpulsion** (int playerNumber)
- void **updatePlayerDeath** (int playerNumber)
- void **updatePlayerResourceAction** (int playerNumber, int resourceId, bool isCollecting)
- void **updatePlayerFork** (int playerNumber)
- const std::vector< zappy::structs::Player > **getPlayers** () const
- const zappy::structs::Player **getPlayer** (int playerNumber) const
- void **addPlayerBroadcast** (int playerNumber, const std::string &message)
- const std::vector< std::pair< int, std::string > > **getPlayersBroadcasting** ()
- void **addIncantation** (const zappy::structs::Incantation incantation)
- void **removeIncantation** (int x, int y, int result)
- const std::vector< zappy::structs::Incantation > **getIncantations** ()
- void **addEgg** (const zappy::structs::Egg egg)
- void **updateEggHatched** (int eggNumber)
- void **updateEggDeath** (int eggNumber)
- const std::vector< zappy::structs::Egg > **getEggs** () const
- void **setGameOver** (const std::string &winningTeam)
- void **playDefeatSound** (const std::string &teamName)
- std::pair< bool, std::string > **isGameOver** () const
- void **addServerMessage** (const std::string &message)
- const std::vector< std::string > **getServerMessages** () const

- void **securityActualisation** ()
- void **incrementPlayerLevel** (int playerNumber)
- void **decrementPlayerLevel** (int playerNumber)
- void **incrementPlayerInventoryItem** (int playerNumber, int resourceId)
- void **decrementPlayerInventoryItem** (int playerNumber, int resourceId)
- void **incrementTileInventoryItem** (int x, int y, int resourceId)
- void **decrementTileInventoryItem** (int x, int y, int resourceId)
- void **updateResourceTotals** ()
- int **getTotalResource** (const std::string &resourceName)
- int **getTotalFood** ()
- int **getTotalEggs** () const
- int **getTotalLinemate** ()
- int **getTotalDeraumere** ()
- int **getTotalSibur** ()
- int **getTotalMendiane** ()
- int **getTotalPhiras** ()
- int **getTotalThystame** ()

Public Member Functions inherited from Subject

- void addObserver (std::shared_ptr< IObserver > observer) override
- void removeObserver (std::shared_ptr< IObserver > observer) override
- void notifyObservers () override
- void notifyGameEvent (GameEventType eventType, const std::string &teamName)

Additional Inherited Members

Protected Attributes inherited from ISubject

- std::vector< std::weak_ptr< IObserver > > **_observers**

The documentation for this class was generated from the following file:

- tests/unit/gui/Game/GameInfos_test.cpp

6.124 TestCase.TestCase Class Reference

Public Member Functions

- **__init__** (self, name, desc, input, output, value, output_folder)
- **execute** (self)
- **check** (self)
- **displayPassed** (self, index)
- **displayFailed** (self, index)

Public Attributes

- **name**
- **desc**
- **input**
- **output**
- **value**
- **tty_mode**
- **tty_input**
- **succeed_after**
- **succeed_forced**
- **real_output**
- **real_value**
- **raw_output**

Protected Member Functions

- **_execute_normal** (self)
- **_execute_tty** (self)

The documentation for this class was generated from the following file:

- tests/functional/TestCase.py

6.125 test_cli.TestCLI Class Reference

Public Member Functions

- test_parse_args_valid (self)
- test_parse_args_valid_ip (self)
- test_parse_args_invalid_option (self)
- test_parse_args_missing_value (self)
- test_parse_args_not_enough_args (self)
- test_parse_port_invalid (self)
- test_parse_port_negative (self)
- test_parse_port_too_large (self)
- test_parse_name_empty (self)
- test_parse_name_whitespace (self)
- test_parse_machine_empty (self)
- test_parse_machine_invalid_ip_format (self)
- test_parse_machine_invalid_ip_value (self)
- test_parse_machine_invalid_ip_chars (self)
- test_validate_config_missing_port (self)
- test_validate_config_missing_name (self)

6.125.1 Member Function Documentation

6.125.1.1 test_parse_args_invalid_option()

```
test_cli.TestCLI.test_parse_args_invalid_option (
               self )
```

Test parsing invalid option

6.125.1.2 test_parse_args_missing_value()

```
test_cli.TestCLI.test_parse_args_missing_value (
               self )
```

Test parsing missing value for option

6.125.1.3 test_parse_args_not_enough_args()

```
test_cli.TestCLI.test_parse_args_not_enough_args (
               self )
```

Test parsing not enough arguments

6.125.1.4 test_parse_args_valid()

```
test_cli.TestCLI.test_parse_args_valid (
               self )
```

Test parsing valid command line arguments

6.125.1.5 test_parse_args_valid_ip()

```
test_cli.TestCLI.test_parse_args_valid_ip (
              self )
```

Test parsing valid IP address

6.125.1.6 test_parse_machine_empty()

```
test_cli.TestCLI.test_parse_machine_empty (
              self )
```

Test parsing empty machine name

6.125.1.7 test_parse_machine_invalid_ip_chars()

```
test_cli.TestCLI.test_parse_machine_invalid_ip_chars (
              self )
```

Test parsing IP with invalid characters

6.125.1.8 test_parse_machine_invalid_ip_format()

```
test_cli.TestCLI.test_parse_machine_invalid_ip_format (
              self )
```

Test parsing invalid IP format

6.125.1.9 test_parse_machine_invalid_ip_value()

```
test_cli.TestCLI.test_parse_machine_invalid_ip_value (
              self )
```

Test parsing invalid IP value

6.125.1.10 test_parse_name_empty()

```
test_cli.TestCLI.test_parse_name_empty (
              self )
```

Test parsing empty team name

6.125.1.11 test_parse_name_whitespace()

```
test_cli.TestCLI.test_parse_name_whitespace (
              self )
```

Test parsing whitespace team name

6.125.1.12 test_parse_port_invalid()

```
test_cli.TestCLI.test_parse_port_invalid (
              self )
```

Test parsing invalid port

6.125.1.13 test_parse_port_negative()

```
test_cli.TestCLI.test_parse_port_negative (
              self )
```

Test parsing negative port

6.125.1.14 test_parse_port_too_large()

```
test_cli.TestCLI.test_parse_port_too_large (
              self )
```

Test parsing port that is too large

6.125.1.15 test_validate_config_missing_name()

```
test_cli.TestCLI.test_validate_config_missing_name (
              self )
```

Test validating config with missing name

6.125.1.16 test_validate_config_missing_port()

```
test_cli.TestCLI.test_validate_config_missing_port (
              self )
```

Test validating config with missing port

The documentation for this class was generated from the following file:

- tests/unit/ai/CLI/test_cli.py

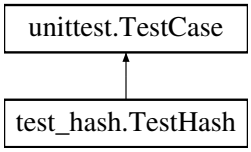
6.126 test_com.TestCommunication Class Reference

The documentation for this class was generated from the following file:

- tests/unit/ai/Communication/test_com.py

6.127 test_hash.TestHash Class Reference

Inheritance diagram for test_hash.TestHash:



Public Member Functions

- **setUp** (self)
- **test_hash_initialization** (self)
- **test_simple_xor** (self)
- **test_hash_message** (self)
- **test_unhash_message** (self)
- **test_hash_unhash_roundtrip** (self)
- **test_different_keys_produce_different_hashes** (self)

Public Attributes

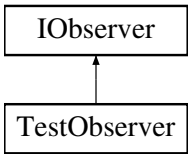
- **hash_obj**

The documentation for this class was generated from the following file:

- tests/unit/ai/Hash/test_hash.py

6.128 TestObserver Class Reference

Inheritance diagram for TestObserver:



Classes

- class TestableGameInfos

Public Member Functions

- **MOCK_METHOD** (void, update,(),(override))
- **MOCK_METHOD** (void, onGameEvent,(GameEventType, const std::string &),(override))

Public Member Functions inherited from IObserver

- virtual void **update** ()=0
- virtual void **onGameEvent** (GameEventType eventType, const std::string &teamName)

The documentation for this class was generated from the following file:

- tests/unit/gui/Game/GameInfos_test.cpp

6.129 test_player.TestPlayer Class Reference

The documentation for this class was generated from the following file:

- tests/unit/ai/Player/test_player.py

6.130 test_socket.TestSocket Class Reference

Public Member Functions

- test_socket_init (self)
- test_socket_connect_success (self, mock_socket)
- test_socket_connect_failure (self, mock_socket)
- test_socket_send_success (self, mock_socket)
- test_socket_send_unicode (self, mock_socket)
- test_socket_receive_connection_closed (self, mock_socket)
- test_socket_receive_unicode (self, mock_socket)
- test_socket_close (self, mock_socket)
- test_socket_different_hosts_and_ports (self)

6.130.1 Member Function Documentation

6.130.1.1 test_socket_close()

```
test_socket.TestSocket.test_socket_close (
              self,
              mock_socket )
```

Test socket close

6.130.1.2 test_socket_connect_failure()

```
test_socket.TestSocket.test_socket_connect_failure (
              self,
              mock_socket )
```

Test socket connection failure

6.130.1.3 test_socket_connect_success()

```
test_socket.TestSocket.test_socket_connect_success (
              self,
              mock_socket )
```

Test successful socket connection

6.130.1.4 test_socket_different_hosts_and_ports()

```
test_socket.TestSocket.test_socket_different_hosts_and_ports (
              self )
```

Test socket creation with different hosts and ports

6.130.1.5 test_socket_init()

```
test_socket.TestSocket.test_socket_init (
              self )
```

Test socket initialization

6.130.1.6 test_socket_receive_connection_closed()

```
test_socket.TestSocket.test_socket_receive_connection_closed (
              self,
              mock_socket )
```

Test handling closed connection during receive

6.130.1.7 test_socket_receive_unicode()

```
test_socket.TestSocket.test_socket_receive_unicode (
              self,
              mock_socket )
```

Test receiving unicode messages

6.130.1.8 test_socket_send_success()

```
test_socket.TestSocket.test_socket_send_success (
               self,
               mock_socket )
```

Test successful message sending

6.130.1.9 test_socket_send_unicode()

```
test_socket.TestSocket.test_socket_send_unicode (
               self,
               mock_socket )
```

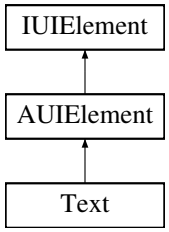
Test sending unicode messages

The documentation for this class was generated from the following file:

- tests/unit/ai/Communication/test_socket.py

6.131 Text Class Reference

Inheritance diagram for Text:



Public Member Functions

- **Text** (std::shared_ptr< IDisplay > raylib, float x, float y, const std::string &text, float fontSize=20.0f, Color32 color=CBLACK)
- void draw () override
- void update () override
- void **setText** (const std::string &text)
- std::string **getText** () const
- void **setFontSize** (float fontSize)
- float **getFontSize** () const
- void **setColor** (Color32 color)
- Color32 **getColor** () const
- void setSize (float width, float height) override
- float **getWidth** () const
- void **setX** (float x)
- void **setY** (float y)

Public Member Functions inherited from AUIElement

- **AUIElement** (std::shared_ptr< IDisplay > display, float x, float y, float width, float height)
- void setPosition (float x, float y) override
- FloatRect getBounds () const override
- bool contains (float x, float y) const override
- void setVisible (bool visible) override
- bool isVisible () const override
- void **setRelativePosition** (float xPercent, float yPercent, float widthPercent, float heightPercent)
- UIRelativePosition **getRelativePosition** () const

Private Attributes

- std::string **_text**
- float **_fontSize**
- Color32 **_color**
- std::shared_ptr< IDisplay > **_display**

Additional Inherited Members

Protected Attributes inherited from AUIElement

- std::shared_ptr< IDisplay > **_display**
- FloatRect **_bounds**
- UIRelativePosition **_relativePos**
- bool **_visible**

6.131.1 Member Function Documentation

6.131.1.1 draw()

```
void Text::draw ( )  [override], [virtual]
```

Implements IUIElement.

6.131.1.2 setSize()

```
void Text::setSize (
            float width,
            float height )  [override], [virtual]
```

Reimplemented from AUIElement.

6.131.1.3 update()

```
void Text::update ( )  [override], [virtual]
```

Implements IUIElement.

The documentation for this class was generated from the following files:

- gui/src/Graphic/HUD/Text/Text.hpp
- gui/src/Graphic/HUD/Text/Text.cpp

6.132 zappy::structs::Tile Struct Reference

Public Member Functions

- **Tile** (int _x=0, int _y=0, int _food=0, int _linemate=0, int _deraumere=0, int _sibur=0, int _mendiane=0, int _phiras=0, int _thystame=0)

Public Attributes

- int **x**
- int **y**
- int **food**
- int **linemate**
- int **deraumere**
- int **sibur**
- int **mendiane**
- int **phiras**
- int **thystame**

The documentation for this struct was generated from the following file:

- gui/src/Utils/Constants.hpp

6.133 tiles_s Struct Reference

Public Attributes

- int **x**
- int **y**

The documentation for this struct was generated from the following file:

- server/include/algo.h

6.134 UIRelativePosition Struct Reference

Public Attributes

- float **xPercent**
- float **yPercent**
- float **widthPercent**
- float **heightPercent**

The documentation for this struct was generated from the following file:

- gui/src/Graphic/HUD/UIElement/AUIElement.hpp

6.135 unified_poll_s Struct Reference

Public Attributes

- struct pollfd ∗ **fds**
- int **count**
- int **capacity**

The documentation for this struct was generated from the following file:

- server/include/zappy.h

6.136 Vector2f Struct Reference

Public Attributes

- float **x**
- float **y**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.137 Vector2i Struct Reference

Public Attributes

- int **x**
- int **y**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.138 Vector3f Struct Reference

Public Member Functions

- bool **operator==** (const Vector3f &other) const
- bool **operator!=** (const Vector3f &other) const

Public Attributes

- float **x**
- float **y**
- float **z**

The documentation for this struct was generated from the following file:

- gui/src/IDisplay.hpp

6.139 zappy_s Struct Reference

Public Attributes

- server_t * **network**
- game_t * **game**
- graph_net_t * **graph**
- params_t * **params**
- unified_poll_t * **unified_poll**

The documentation for this struct was generated from the following file:

- server/include/zappy.h

Chapter 7

File Documentation

7.1 AAudio.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Audio
00006 */
00007
00008 #ifndef AUDIO_HPP_
00009 #define AUDIO_HPP_
00010
00011 #include <string>
00012 #include <map>
00013 #include <memory>
00014 #include <vector>
00015 #include "IAudio.hpp"
00016
00017 class AAudio : public IAudio {
00018     protected:
00019         std::vector<std::string> _musicId = {"main_theme", "main_theme2"};
00020         std::vector<std::string> _sfxId = {"click", "clickPlayer", "collect",
00021                                            "win", "loose", "zap", "splash_screen"};
00022         float _levelSFX = 75.f;
00023         float _levelMusic = 50.f;
00024         int _themeIndex = 0;
00025
00026     public:
00027         AAudio() = default;
00028         ~AAudio() = default;
00029
00030         float getSFXVolumeLevel();
00031         float getMusicVolumeLevel();
00032
00033         void setSFXVolumeLevel(float);
00034         void setMusicVolumeLevel(float);
00035
00036         void playMainTheme(float volume);
00037         void playNextTheme(float volume);
00038 };
00039
00040 #endif /* !AUDIO_HPP_ */
```

7.2 IAudio.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** IAudio
00006 */
00007
00008 #ifndef IAUDIO_HPP_
00009 #define IAUDIO_HPP_
00010
00011 #include <string>
00012
00013 class IAudio {
00014     public:
00015         virtual ~IAudio() = default;
00016
```

```
00017         virtual float getSFXVolumeLevel() = 0;
00018         virtual float getMusicVolumeLevel() = 0;
00019
00020         virtual void setSFXVolumeLevel(float) = 0;
00021         virtual void setMusicVolumeLevel(float) = 0;
00022
00023         virtual bool loadSound(const std::string& id, const std::string& filepath) = 0;
00024
00025         virtual void playMainTheme(float volume) = 0;
00026         virtual void playNextTheme(float volume) = 0;
00027
00028         virtual void playSound(const std::string& id, float volume) = 0;
00029         virtual void stopSound(const std::string& id) = 0;
00030         virtual bool isSoundPlaying(const std::string& id) const = 0;
00031
00032         virtual void setSoundLooping(const std::string& id, bool looping) = 0;
00033         virtual void setSoundVolume(const std::string& id, float volume) = 0;
00034 };
00035
00036 #endif /* !IAUDIO_HPP_ */
```

7.3 SFMLAudio.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** gui
00004 ** File description:
00005 ** SFMLAudio.hpp
00006 */
00007
00008 #ifndef SFMLAUDIO_HPP
00009 #define SFMLAUDIO_HPP
00010
00011 #include <string>
00012 #include <memory>
00013 #include <map>
00014 #include <SFML/Audio.hpp>
00015 #include "../AAudio.hpp"
00016
00017
00018 class SFMLAudio : public AAudio{
00019     private:
00020         std::map<std::string, std::unique_ptr<sf::Music» _sounds;
00021
00022     public:
00023         bool loadSound(const std::string& id, const std::string& filepath);
00024
00025         void playSound(const std::string& id, float volume);
00026         void stopSound(const std::string& id);
00027         bool isSoundPlaying(const std::string& id) const;
00028
00029         void setSoundLooping(const std::string& id, bool looping);
00030
00031         void setSoundVolume(const std::string& id, float volume);
00032
00033         SFMLAudio();
00034         ~SFMLAudio();
00035 };
00036
00037
00038
00039 #endif  // SFMLAUDIO_HPP
```

7.4 CLI.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** CLI
00006 */
00007
00008 #ifndef CLI_HPP_
00009 #define CLI_HPP_
00010
00011 #include <string>
00012 #include "../Utils/Constants.hpp"
00013
00014 class CLI {
00015     public:
00016         CLI(int ac, const char *const *av);
00017         ~CLI();
```

```
00018
00019         zappy::structs::Config parseArguments(int ac, const char *const *av) const;
00020
00021     private:
00022         int _ac;
00023         const char *const *_av;
00024
00025         bool hasCorrectNumberOfArguments(int ac) const;
00026         int parsePort(const char *portStr) const;
00027         std::string parseHostname(const char *hostnameStr) const;
00028         void validateConfig(bool portFound, bool hostFound) const;
00029 };
00030
00031 #endif /* !CLI_HPP_ */
```

7.5 Client.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Client
00006 */
00007
00008 #ifndef CLIENT_HPP_
00009 #define CLIENT_HPP_
00010
00011 #include <memory>
00012 #include <vector>
00013 #include <filesystem>
00014 #include <string>
00015 #include "../Utils/Constants.hpp"
00016 #include "../Communication/ICommunication.hpp"
00017 #include "../Game/GameInfos.hpp"
00018 #include "../Graphic/GUI.hpp"
00019 #include "MsgHandler.hpp"
00020 #include "../Observer/GuiObserver.hpp"
00021 #include "DLLoader/LoaderType.hpp"
00022 #include "../Observer/IObserver.hpp"
00023
00024 class Client {
00025     private:
00026         std::vector<std::string> _pathLibGraphic;
00027         std::vector<std::string> _pathLibAudio;
00028         zappy::structs::Config _config;
00029
00030         std::shared_ptr<ICommunication> _communication;
00031         std::shared_ptr<GameInfos> _gameInfos;
00032         std::unique_ptr<MsgHandler> _msgHandler;
00033         std::shared_ptr<GUI> _gui;
00034         std::shared_ptr<GuiObserver> _guiObserver;
00035
00036         bool _checkIfCorrectModuleType(ModuleType_t type, const std::string &path);
00037         void initialize(int ac, const char * const *av);
00038         void _retrieveAllGraphicSharedLib(const std::string &path = "gui/lib/");
00039         void _retrieveAllAudioSharedLib(const std::string &path = "gui/lib/");
00040     public:
00041         Client(int ac, const char *const *av);
00042         ~Client();
00043
00044         void _createGUI();
00045 };
00046
00047 #endif /* !CLIENT_HPP_ */
```

7.6 MsgHandler.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** MsgHandler
00006 */
00007
00008 #ifndef MSGHANDLER_HPP_
00009 #define MSGHANDLER_HPP_
00010
00011 #include <memory>
00012 #include <map>
00013 #include <functional>
00014 #include <thread>
00015 #include <mutex>
```

```
00016 #include <atomic>
00017 #include <queue>
00018 #include <condition_variable>
00019 #include <string>
00020
00021 #include "../Game/GameInfos.hpp"
00022 #include "../Communication/ICommunication.hpp"
00023 #include "../Utils/Constants.hpp"
00024
00025 class MsgHandler {
00026     public:
00027         MsgHandler(std::shared_ptr<GameInfos> gameInfos,
00028             std::shared_ptr<ICommunication> communication);
00029         ~MsgHandler();
00030
00031         void start();
00032         void stop();
00033
00034         void handleMessage(const std::string& message);
00035
00036     protected:
00037         void messageLoop();
00038
00039         bool handleWelcomeMessage(const std::string& message);
00040         bool handleMszMessage(const std::string& message);
00041         bool handleBctMessage(const std::string& message);
00042         bool handleTnaMessage(const std::string& message);
00043         bool handlePnwMessage(const std::string& message);
00044         bool handlePpoMessage(const std::string& message);
00045         bool handlePlvMessage(const std::string& message);
00046         bool handlePinMessage(const std::string& message);
00047         bool handlePexMessage(const std::string& message);
00048         bool handlePbcMessage(const std::string& message);
00049         bool handlePicMessage(const std::string& message);
00050         bool handlePieMessage(const std::string& message);
00051         bool handlePfkMessage(const std::string& message);
00052         bool handlePdrMessage(const std::string& message);
00053         bool handlePgtMessage(const std::string& message);
00054         bool handlePdiMessage(const std::string& message);
00055         bool handleEnwMessage(const std::string& message);
00056         bool handleEboMessage(const std::string& message);
00057         bool handleEdiMessage(const std::string& message);
00058         bool handleSgtMessage(const std::string& message);
00059         bool handleSstMessage(const std::string& message);
00060         bool handleSegMessage(const std::string& message);
00061         bool handleSmgMessage(const std::string& message);
00062         bool handleSucMessage(const std::string& message);
00063         bool handleSbpMessage(const std::string& message);
00064
00065     private:
00066         std::thread _thread;
00067         std::atomic<bool> _running;
00068         std::mutex _mutex;
00069         std::condition_variable _condition;
00070
00071         std::shared_ptr<GameInfos> _gameInfos;
00072         std::shared_ptr<ICommunication> _communication;
00073         std::mutex _gameInfosMutex;
00074
00075         std::map<std::string, std::function<bool(const std::string&)>> _messageHandlers;
00076 };
00077
00078 #endif /* !MSGHANDLER_HPP_ */
```

7.7 Communication.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Communication
00006 */
00007
00008 #ifndef COMMUNICATION_HPP_
00009 #define COMMUNICATION_HPP_
00010
00011 #include <sys/socket.h>
00012 #include <netinet/in.h>
00013 #include <arpa/inet.h>
00014 #include <unistd.h>
00015 #include <fcntl.h>
00016 #include <poll.h>
00017 #include <netdb.h>
00018 #include <thread>
00019 #include <mutex>
```

```
00020 #include <atomic>
00021 #include <condition_variable>
00022 #include <queue>
00023 #include <string>
00024 #include <vector>
00025
00026 #include "../Utils/Constants.hpp"
00027 #include "../Exceptions/Exceptions.hpp"
00028 #include "ICommunication.hpp"
00029
00030 class Communication : public ICommunication {
00031     public:
00032         explicit Communication(zappy::structs::Config config);
00033         ~Communication();
00034
00035         void sendMessage(const std::string &message) override;
00036         bool hasMessages() const override;
00037         std::string popMessage() override;
00038         bool isConnected() const override;
00039         void disconnect() override;
00040
00041     private:
00042         void setupConnection();
00043         void createSocket();
00044         void connectToServer();
00045         void setupNonBlocking();
00046
00047         void startCommunicationThread();
00048         void communicationLoop();
00049         bool handlePoll();
00050         void processWrite();
00051         void processRead();
00052
00053         void parseReceivedData();
00054
00055         zappy::structs::Config _config;
00056         std::thread _thread;
00057         std::mutex _mutex;
00058         std::condition_variable _cv;
00059         std::atomic<bool> _running;
00060         std::atomic<bool> _connected;
00061
00062         std::queue<std::string> _outgoingMessages;
00063         std::queue<std::string> _incomingMessages;
00064
00065         std::string _receiveBuffer;
00066         std::string _sendBuffer;
00067
00068         int _socket;
00069         struct pollfd _pollfd;
00070         static const int BUFFER_SIZE = 4096;
00071         static const char MESSAGE_DELIMITER = '\n';
00072 };
00073
00074 #endif /* !COMMUNICATION_HPP_ */
```

7.8 ICommunication.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** ICommunication
00006 */
00007
00008 #ifndef ICOMMUNICATION_HPP_
00009 #define ICOMMUNICATION_HPP_
00010
00011 #include <string>
00012
00013 class ICommunication {
00014     public:
00015         virtual ~ICommunication() = default;
00016
00017         virtual void sendMessage(const std::string &message) = 0;
00018         virtual bool hasMessages() const = 0;
00019         virtual std::string popMessage() = 0;
00020         virtual bool isConnected() const = 0;
00021         virtual void disconnect() = 0;
00022 };
00023
00024 #endif /* !ICOMMUNICATION_HPP_ */
```

7.9 DLLoader.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** zappy
00004 ** File description:
00005 ** DLLoader
00006 */
00007
00008 #ifndef DLLOADER_HPP_
00009 #define DLLOADER_HPP_
00010
00011 #include <dlfcn.h>
00012 #include <iostream>
00013 #include <ostream>
00014 #include <memory>
00015 #include "ILoader.hpp"
00016 #include "../Audio/IAudio.hpp"
00017 #include "../IDisplay.hpp"
00018
00019 template <typename T>
00020
00021 class DLLoader : public ILoader {
00022     private:
00023         void *_handler = nullptr;
00024
00025     public:
00026         ~DLLoader() = default;
00027
00028         void *getHandler() const override {
00029             return _handler;
00030         };
00031         void *Open(const char *path, int flag = RTLD_LAZY) override {
00032             _handler = dlopen(path, flag);
00033             return _handler;
00034         };
00035         void *Symbol(const char *symbolName) override {
00036             void *symbol = dlsym(_handler, symbolName);
00037             const char *error = dlerror();
00038             if (error) {
00039                 std::cerr « "dlerror: " « error « std::endl;
00040                 return nullptr;
00041             }
00042             return symbol;
00043         };
00044         T getSymbol(const char *symbolName) {
00045             return reinterpret_cast<T>(dlsym(_handler, symbolName));
00046         };
00047         int Close() override{
00048             if (_handler == nullptr)
00049                 return -1;
00050             return dlclose(_handler);
00051         };
00052         const char *Error() override {
00053             return dlerror();
00054         };
00055 };
00056
00057 typedef std::shared_ptr<IDisplay> (*createGraphicFunc_t)();
00058 typedef std::shared_ptr<IAudio> (*createAudioFunc_t)();
00059
00060 #endif /* !DLLOADER_HPP_ */
```

7.10 ILoader.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** zappy
00004 ** File description:
00005 ** ILoader
00006 */
00007
00008 #ifndef ILoader_HPP_
00009 #define ILoader_HPP_
00010
00011
00012 class ILoader {
00013     public:
00014         ~ILoader() = default;
00015
00016         virtual void *Open(const char *path, int flag) = 0;
00017         virtual void *Symbol(const char *symbolName) = 0;
00018         virtual int Close() = 0;
00019         virtual const char *Error() = 0;
```

```
00020         virtual void *getHandler() const = 0;
00021
00022     protected:
00023     private:
00024 };
00025
00026 #endif /* !ILoader_HPP_ */
```

7.11 LoaderType.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** zappy
00004 ** File description:
00005 ** LoaderType
00006 */
00007
00008 #ifndef LOADERTYPE_HPP_
00009 #define LOADERTYPE_HPP_
00010
00011 enum ModuleType_t{
00012     DISPLAY_MODULE,
00013     AUDIO_MODULE,
00014     NONE
00015 };
00016
00017 typedef ModuleType_t (*getTypeFunc_t)();
00018
00019 #endif /* !LOADERTYPE_HPP_ */
```

7.12 Exceptions.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Exceptions
00006 */
00007
00008 #ifndef EXCEPTIONS_HPP_
00009 #define EXCEPTIONS_HPP_
00010
00011 #include <exception>
00012 #include <string>
00013 #include "../Utils/Constants.hpp"
00014
00015 namespace Exceptions {
00016
00017     // CLI Exceptions
00018     class CLIParsingException : public std::exception {
00019         public:
00020             explicit CLIParsingException(const std::string &message)
00021                 : _message(std::string(colors::T_RED) +
00022                           "CLI Parsing Error: " + message +
00023                           colors::RESET) {}
00024
00025             const char *what() const noexcept override {
00026                 return _message.c_str();
00027             }
00028
00029         private:
00030             std::string _message;
00031     };
00032
00033     class CLIPortException : public CLIParsingException {
00034         public:
00035             explicit CLIPortException(const std::string &message)
00036                 : CLIParsingException(std::string(colors::T_CYAN) +
00037                                       "Port Error: " + message +
00038                                       colors::RESET) {}
00039     };
00040
00041     class CLIHostException : public CLIParsingException {
00042         public:
00043             explicit CLIHostException(const std::string &message)
00044                 : CLIParsingException(std::string(colors::T_CYAN) +
00045                                       "Hostname Error: " + message +
00046                                       colors::RESET) {}
00047     };
00048
00049     class CLIMissingArgumentException : public CLIParsingException {
00050         public:
```

```
00051             explicit CLIMissingArgumentException(const std::string &message)
00052                 : CLIParsingException(std::string(colors::T_CYAN) +
00053                                       "Missing Argument: " + message +
00054                                       colors::RESET) {}
00055     };
00056
00057     class CLIInvalidArgumentException : public CLIParsingException {
00058         public:
00059             explicit CLIInvalidArgumentException(const std::string &message)
00060                 : CLIParsingException(std::string(colors::T_CYAN) +
00061                                       "Invalid Argument: " + message +
00062                                       colors::RESET) {}
00063     };
00064
00065     class NetworkException : public std::exception {
00066         public:
00067             explicit NetworkException(const std::string &message)
00068                 : _message(std::string(colors::T_RED) +
00069                           "Network Error: " + message +
00070                           colors::RESET) {}
00071
00072             const char *what() const noexcept override {
00073                 return _message.c_str();
00074             }
00075
00076         private:
00077             std::string _message;
00078     };
00079
00080     class ConnectionFailedException : public NetworkException {
00081         public:
00082             explicit ConnectionFailedException(const std::string &message)
00083                 : NetworkException(std::string(colors::T_CYAN) +
00084                                    "Connection Failed: " + message +
00085                                    colors::RESET) {}
00086     };
00087
00088     class SocketCreationException : public NetworkException {
00089         public:
00090             explicit SocketCreationException(const std::string &message)
00091                 : NetworkException(std::string(colors::T_CYAN) +
00092                                    "Socket Creation Failed: " + message +
00093                                    colors::RESET) {}
00094     };
00095
00096     class ConnectionTimeoutException : public NetworkException {
00097         public:
00098             explicit ConnectionTimeoutException(const std::string &message)
00099                 : NetworkException(std::string(colors::T_CYAN) +
00100                                    "Connection Timeout: " + message +
00101                                    colors::RESET) {}
00102     };
00103
00104     class SendException : public NetworkException {
00105         public:
00106             explicit SendException(const std::string &message)
00107                 : NetworkException(std::string(colors::T_CYAN) +
00108                                    "Send Error: " + message +
00109                                    colors::RESET) {}
00110     };
00111
00112     class ReceiveException : public NetworkException {
00113         public:
00114             explicit ReceiveException(const std::string &message)
00115                 : NetworkException(std::string(colors::T_CYAN) +
00116                                    "Receive Error: " + message +
00117                                    colors::RESET) {}
00118     };
00119
00120     class ModuleGraphicError : public std::exception {
00121         private:
00122             std::string _message = "";
00123         public:
00124             explicit ModuleGraphicError(const std::string &msg) : _message(msg) {};
00125             const char *what() const noexcept override {
00126                 return this->_message.c_str();
00127             }
00128     };
00129
00130     class ModuleAudioError : public std::exception {
00131         private:
00132             std::string _message = "";
00133         public:
00134             explicit ModuleAudioError(const std::string &msg) : _message(msg) {};
00135             const char *what() const noexcept override {
00136                 return this->_message.c_str();
00137             }
```

```
00138     };
00139 }
00140
00141 #endif /* !EXCEPTIONS_HPP_ */
```

7.13 GameInfos.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** GameInfos
00006 */
00007
00008 #ifndef GAMEINFOS_HPP_
00009 #define GAMEINFOS_HPP_
00010
00011 #include <utility>
00012 #include <vector>
00013 #include <memory>
00014 #include <mutex>
00015 #include <string>
00016 #include <chrono>
00017 #include <unordered_map>
00018
00019 #include "../Utils/Constants.hpp"
00020 #include "../Communication/ICommunication.hpp"
00021 #include "../Observer/Subject.hpp"
00022 #include "../Audio/IAudio.hpp"
00023
00024 class GameInfos : public Subject {
00025     public:
00026         explicit GameInfos(std::shared_ptr<ICommunication> communication);
00027         ~GameInfos();
00028
00029         void setAudio(std::shared_ptr<IAudio> audio);
00030         void setCurrentCameraMode(zappy::gui::CameraMode cameraMode);
00031         void setCurrentPlayerFocus(int playerId);
00032         void setPerformanceMode(bool performanceMode);
00033
00034         void setMapSize(int width, int height);
00035         std::pair<int, int> getMapSize() const;
00036
00037         void setTimeUnit(int timeUnit, bool sendToServer = false);
00038         int getTimeUnit() const;
00039
00040         void updateTile(const zappy::structs::Tile tile);
00041         const zappy::structs::Tile getTile(int x, int y) const;
00042         const zappy::structs::Tile& getTileRef(int x, int y) const;
00043         void initializeTileMatrix();
00044
00045         void updateTeamName(const std::string &teamName);
00046         const std::vector<std::string> getTeamNames() const;
00047
00048         void setTeamVisibility(const std::string &teamName, bool visible);
00049         bool isTeamVisible(const std::string &teamName) const;
00050         const std::unordered_map<std::string, bool> getTeamVisibilities() const;
00051
00052         void setObjectVisibility(const std::string &objectType, bool visible);
00053         bool isObjectVisible(const std::string &objectType) const;
00054         const std::unordered_map<std::string, bool> getObjectVisibilities() const;
00055
00056         Color32 getTeamColor(const std::string &teamName);
00057
00058         void addPlayer(const zappy::structs::Player player);
00059         void killPlayer(int playerNumber);
00060         void updatePlayerPosition(int playerNumber, int x, int y);
00061         void updatePlayerOrientation(int playerNumber, int orientation);
00062         void updatePlayerLevel(int playerNumber, int level);
00063         void updatePlayerInventory(int playerNumber,
00064             const zappy::structs::Inventory inventory);
00065         void updatePlayerExpulsion(int playerNumber);
00066         void updatePlayerDeath(int playerNumber);
00067         void updatePlayerResourceAction(int playerNumber, int resourceId, bool isCollecting);
00068         void updatePlayerFork(int playerNumber);
00069         const std::vector<zappy::structs::Player> getPlayers() const;
00070         const zappy::structs::Player getPlayer(int playerNumber) const;
00071
00072         void addPlayerBroadcast(int playerNumber, const std::string &message);
00073         const std::vector<std::pair<int, std::string>> getPlayersBroadcasting();
00074
00075         void addIncantation(const zappy::structs::Incantation incantation);
00076         void removeIncantation(int x, int y, int result);
00077         const std::vector<zappy::structs::Incantation> getIncantations();
00078
```

```
00079         void addEgg(const zappy::structs::Egg egg);
00080         void updateEggHatched(int eggNumber);
00081         void updateEggDeath(int eggNumber);
00082         const std::vector<zappy::structs::Egg> getEggs() const;
00083
00084         void setGameOver(const std::string &winningTeam);
00085         void playDefeatSound(const std::string &teamName);
00086         std::pair<bool, std::string> isGameOver() const;
00087
00088         void addServerMessage(const std::string &message);
00089         const std::vector<std::string> getServerMessages() const;
00090
00091         void securityActualisation();
00092         void incrementPlayerLevel(int playerNumber);
00093         void decrementPlayerLevel(int playerNumber);
00094         void incrementPlayerInventoryItem(int playerNumber, int resourceId);
00095         void decrementPlayerInventoryItem(int playerNumber, int resourceId);
00096         void incrementTileInventoryItem(int x, int y, int resourceId);
00097         void decrementTileInventoryItem(int x, int y, int resourceId);
00098
00099         void updateResourceTotals();
00100         int getTotalResource(const std::string& resourceName);
00101         int getTotalFood();
00102         int getTotalEggs() const;
00103         int getTotalLinemate();
00104         int getTotalDeraumere();
00105         int getTotalSibur();
00106         int getTotalMendiane();
00107         int getTotalPhiras();
00108         int getTotalThystame();
00109
00110     private:
00111         int _mapWidth;
00112         int _mapHeight;
00113         int _timeUnit;
00114
00115         std::vector<std::vector<zappy::structs::Tile» _tileMatrix;
00116         bool _matrixInitialized;
00117         std::vector<std::string> _teamNames;
00118         std::unordered_map<std::string, bool> _teamVisibilities;
00119         std::unordered_map<std::string, Color32> _teamColors;
00120         std::unordered_map<std::string, bool> _objectVisibilities;
00121         std::vector<Color32> _colors;
00122         int _colorIndex = 0;
00123         std::vector<zappy::structs::Player> _players;
00124         std::vector<std::tuple<int, std::string, std::chrono::steady_clock::time_point»
00125             _playersBroadcasting;
00126         std::vector<zappy::structs::Incantation> _incantations;
00127         std::vector<zappy::structs::Egg> _eggs;
00128         std::vector<std::string> _serverMessages;
00129
00130         bool _gameOver;
00131         std::string _winningTeam;
00132         bool _victorySoundPlayed;
00133
00134         mutable std::mutex _dataMutex;
00135
00136         std::shared_ptr<ICommunication> _communication;
00137         std::shared_ptr<IAudio> _audio;
00138         zappy::gui::CameraMode _currentCameraMode;
00139         int _currentPlayerFocus;
00140
00141         mutable std::unordered_map<std::string, int> _resourceTotals;
00142         mutable bool _resourceTotalsNeedUpdate = true;
00143         bool _performanceMode = false;
00144
00145         void notifyStateChange();
00146 };
00147
00148 #endif /* !GAMEINFOS_HPP_ */
```

7.14 CameraManager.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** CameraManager
00006 */
00007
00008 #ifndef CAMERA_MANAGER_HPP_
00009 #define CAMERA_MANAGER_HPP_
00010
00011 #include <memory>
00012 #include "../../Utils/Constants.hpp"
```

```
00013 #include "../../Game/GameInfos.hpp"
00014 #include "../Map.hpp"
00015
00016 class CameraManager {
00017     public:
00018         explicit CameraManager(std::shared_ptr<IDisplay> display);
00019         ~CameraManager();
00020
00021         void updateCamera(zappy::gui::CameraMode mode);
00022         void updateCameraFreeMode();
00023         void updateCameraTargetMode();
00024         void updateCameraPlayerMode();
00025
00026         void setMapCenter(const Vector3f &center);
00027         void setMapSize(int width, int height);
00028
00029         void setTargetDistance(float distance);
00030         void initTargetPositionFromCurrentCamera();
00031
00032         void setPlayerId(int playerId);
00033         int getPlayerId() const;
00034         void setGameInfos(std::shared_ptr<GameInfos> gameInfos);
00035         void setMapInstance(std::shared_ptr<Map> map);
00036
00037         float getCameraMovingSpeed();
00038         void setCameraMovingSpeed(float);
00039         float getCameraRotaSpeed();
00040         void setCameraRotaSpeed(float);
00041         float getCameraZoomSpeed();
00042         void setCameraZoomSpeed(float);
00043
00044         Vector3f calculatePlayerPosition(const zappy::structs::Player& player);
00045         Vector3f calculateCameraPosition(const Vector3f& playerPos, float angleXZ);
00046
00047     private:
00048         float _cameraMovingSpeed = 15.0f;
00049         float _cameraRotaSpeed = 2.0f;
00050         float _cameraZoomSpeed = 120.0f;
00051         std::shared_ptr<IDisplay> _display;
00052         std::shared_ptr<GameInfos> _gameInfos;
00053         std::shared_ptr<Map> _map;
00054         Vector3f _mapCenter;
00055         int _mapWidth;
00056         int _mapHeight;
00057
00058         float _targetDistance;
00059         float _targetAngleXZ;
00060         float _targetAngleY;
00061         bool _isDragging;
00062         int _playerId;
00063
00064         float _playerAngleXZ;
00065         bool _isPlayerViewDragging;
00066
00067         void handlePlayerCameraMouseInput();
00068 };
00069
00070 #endif /* !CAMERA_MANAGER_HPP_ */
```

7.15 GUI.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** GUI
00006 */
00007
00008 #ifndef GUI_HPP_
00009 #define GUI_HPP_
00010
00011 #include <memory>
00012 #include <string>
00013 #include <utility>
00014 #include <mutex>
00015 #include "../Game/GameInfos.hpp"
00016 #include "Map.hpp"
00017 #include "HUD/HUD.hpp"
00018 #include "SplashScreen.hpp"
00019 #include "../Audio/IAudio.hpp"
00020 #include "../Utils/Constants.hpp"
00021 #include "Camera/CameraManager.hpp"
00022 #include "../IDisplay.hpp"
00023 #include "../DLLoader/DLLoader.hpp"
00024 #include "DLLoader/LoaderType.hpp"
```

```
00025
00026 class GUI {
00027     public:
00028         GUI(std::shared_ptr<GameInfos> gameInfos,
00029             const std::string &libGraphicPath,
00030             const std::string &libAudioPath);
00031         ~GUI();
00032
00033         void run();
00034         void refresh();
00035         void handleVictory(const std::string &teamName);
00036
00037         int getWindowWidth() const;
00038         int getWindowHeight() const;
00039         void setWindowWidth(int width);
00040         void setWindowHeight(int height);
00041
00042         void switchCameraMode(zappy::gui::CameraMode mode);
00043         void switchCameraModeNext();
00044         void setPlayerToFollow(int playerId);
00045         int getPlayerToFollow() const;
00046         bool selectFirstAvailablePlayer();
00047         void switchToNextPlayer();
00048         void switchToPreviousPlayer();
00049
00050     private:
00051         static int _getRandomTime(int min, int max);
00052         void updateCamera();
00053         virtual void update();
00054         virtual void draw();
00055         virtual bool isRunning();
00056         bool playerExists(int playerId) const;
00057         void drawSplashFrame();
00058
00059         void initModels();
00060         void initPlayers();
00061         void handlePlayerClicks();
00062         int getPlayerUnderMouse() const;
00063         BoundingBox3D getPlayerBoundingBox(const zappy::structs::Player& player) const;
00064
00065         void handleTileClicks();
00066         std::pair<int, int> getTileUnderMouse() const;
00067         BoundingBox3D getTileBoundingBox(int x, int y) const;
00068
00069         std::string _currentLibLoaded;
00070         bool _isRunning;
00071
00072         DLLoader<std::shared_ptr<IDisplay>> _dlLoaderGraphic;
00073         DLLoader<std::shared_ptr<IDisplay>> _dlLoaderAudio;
00074         std::shared_ptr<IDisplay> _display;
00075         std::shared_ptr<GameInfos> _gameInfos;
00076         std::unique_ptr<Map> _map;
00077         std::unique_ptr<HUD> _hud;
00078         std::unique_ptr<SplashScreen> _splashScreen;
00079         std::shared_ptr<IAudio> _audio;
00080         std::shared_ptr<CameraManager> _cameraManager;
00081
00082         int _windowWidth;
00083         int _windowHeight;
00084
00085         zappy::gui::CameraMode _cameraMode;
00086         bool _isHUDVisible = true;
00087         bool _backgroundLoaded;
00088         bool _skyboxLoaded;
00089         int _hoveredPlayerId;
00090         std::pair<int, int> _selectedTile;
00091
00092         bool _performanceMode = false;
00093         bool _showingSplashScreen = true;
00094         bool _loadingComplete = false;
00095
00096         mutable std::mutex _playerMutex;
00097 };
00098
00099 #endif /* !GUI_HPP_ */
```

7.16 Button.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Button
00006 */
00007
```

```
00008 #pragma once
00009
00010 #include <string>
00011 #include <functional>
00012 #include <memory>
00013
00014 #include "../UIElement/AUIElement.hpp"
00015 #include "../../../Audio/IAudio.hpp"
00016 #include "../../../IDisplay.hpp"
00017
00018 class Button : public AUIElement {
00019     public:
00020         Button(
00021             std::shared_ptr<IDisplay> display,
00022             std::shared_ptr<IAudio> audio,
00023             float x, float y,
00024             float width, float height,
00025             const std::string& text,
00026             std::function<void()> callback
00027         );
00028
00029         ~Button() override = default;
00030
00031         void draw() override;
00032
00033         void update() override;
00034
00035         void setText(const std::string& text);
00036
00037         std::string getText() const;
00038
00039         void setCallback(std::function<void()> callback);
00040
00041         void setColors(
00042             Color32 normal,
00043             Color32 hover,
00044             Color32 pressed,
00045             Color32 textColor
00046         );
00047
00048         void setSize(float width, float height) override;
00049
00050     private:
00051         std::string _text;
00052         std::function<void()> _callback;
00053
00054         Color32 _normalColor;
00055         Color32 _hoverColor;
00056         Color32 _pressedColor;
00057         Color32 _textColor;
00058
00059         bool _isHovered;
00060         bool _isPressed;
00061
00062         std::shared_ptr<IDisplay> _display;
00063         std::shared_ptr<IAudio> _audio;
00064 };
```

7.17 Checkbox.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Checkbox
00006 */
00007
00008 #pragma once
00009
00010 #include <string>
00011 #include <functional>
00012 #include <memory>
00013
00014 #include "../UIElement/AUIElement.hpp"
00015 #include "../../../Audio/IAudio.hpp"
00016 #include "../../../IDisplay.hpp"
00017
00018 class Checkbox : public AUIElement {
00019     public:
00020         Checkbox(
00021             std::shared_ptr<IDisplay> display,
00022             std::shared_ptr<IAudio> audio,
00023             float x, float y,
00024             float width, float height,
00025             bool initialValue,
```

```
00026             std::function<void(bool)> callback
00027         );
00028
00029         ~Checkbox() override = default;
00030
00031         void draw() override;
00032
00033         void update() override;
00034
00035         void setCallback(std::function<void(bool)> callback);
00036
00037         void setValue(bool value);
00038
00039         bool getValue() const;
00040
00041         void setColors(
00042             Color32 normalColor,
00043             Color32 hoverColor,
00044             Color32 pressedColor,
00045             Color32 checkColor
00046         );
00047
00048         void setSize(float width, float height) override;
00049
00050         bool containsCheckbox(float x, float y) const;
00051
00052     private:
00053         bool _value;
00054         std::function<void(bool)> _callback;
00055
00056         Color32 _normalColor;
00057         Color32 _hoverColor;
00058         Color32 _pressedColor;
00059         Color32 _checkColor;
00060
00061         bool _isHovered;
00062         bool _isPressed;
00063
00064         std::shared_ptr<IDisplay> _display;
00065         std::shared_ptr<IAudio> _audio;
00066
00067         float _checkboxSize;
00068 };
```

7.18 AContainers.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** AContainers
00006 */
00007
00008 #pragma once
00009
00010 #include <string>
00011 #include <vector>
00012 #include <memory>
00013
00014 #include "IContainers.hpp"
00015
00016 struct RelativePosition {
00017     float xPercent;
00018     float yPercent;
00019     float widthPercent;
00020     float heightPercent;
00021 };
00022
00023 class AContainers : public IContainers {
00024     public:
00025         AContainers(std::shared_ptr<IDisplay> display, float x, float y, float width,
00026             float height);
00027
00028         virtual ~AContainers() = default;
00029
00030         void setPosition(float x, float y) override;
00031         void setSize(float width, float height) override;
00032         FloatRect getBounds() const override;
00033         bool contains(float x, float y) const override;
00034         void setVisible(bool visible) override;
00035         bool isVisible() const override;
00036
00037         void setRelativePosition(float xPercent, float yPercent, float widthPercent,
00038             float heightPercent);
00039
```

```
00040         RelativePosition getRelativePosition() const;
00041
00042         void updatePositionFromRelative();
00043
00044         float getWidth() const;
00045         float getHeight() const;
00046
00047     protected:
00048         std::shared_ptr<IDisplay> _display;
00049         FloatRect _bounds;
00050         RelativePosition _relativePos;
00051         Color32 _backgroundColor;
00052         bool _visible;
00053         bool _hasBackground;
00054 };
```

7.19 Containers.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Containers
00006 */
00007
00008 #pragma once
00009
00010 #include <vector>
00011 #include <functional>
00012 #include <unordered_map>
00013 #include <memory>
00014 #include <string>
00015
00016 #include "AContainers.hpp"
00017 #include "../UIElement/IUIElement.hpp"
00018 #include "../Button/Button.hpp"
00019 #include "../Text/Text.hpp"
00020 #include "../Slider/Slider.hpp"
00021 #include "../Image/Image.hpp"
00022 #include "../ImageButton/ImageButton.hpp"
00023 #include "../Checkbox/Checkbox.hpp"
00024 #include "../../../Audio/IAudio.hpp"
00025 #include "../../../IDisplay.hpp"
00026
00027 class Containers : public AContainers {
00028     public:
00029         Containers(std::shared_ptr<IDisplay> display, std::shared_ptr<IAudio> audio,
00030             float x, float y, float width, float height,
00031             Color32 backgroundColor = {40, 40, 40, 200});
00032
00033         ~Containers() override = default;
00034
00035         void draw() override;
00036
00037         void update() override;
00038
00039         void setBackgroundColor(Color32 color);
00040
00041         bool addElement(const std::string& id, std::shared_ptr<IUIElement> element);
00042
00043         std::shared_ptr<IUIElement> getElement(const std::string& id) const;
00044
00045         bool removeElement(const std::string& id);
00046
00047         std::shared_ptr<Button> addButton(
00048             const std::string& id,
00049             float x, float y,
00050             float width, float height,
00051             const std::string& text,
00052             std::function<void()> callback
00053         );
00054
00055         std::shared_ptr<Button> addButton(
00056             const std::string& id,
00057             float x, float y,
00058             float width, float height,
00059             const std::string& text,
00060             std::function<void()> callback,
00061             Color32 normalColor,
00062             Color32 hoverColor,
00063             Color32 pressedColor,
00064             Color32 textColor
00065         );
00066
00067         std::shared_ptr<Text> addText(
```

```
00068             const std::string& id,
00069             float x, float y,
00070             const std::string& text,
00071             float fontSize = 20.0f,
00072             Color32 color = CBLACK
00073         );
00074
00075         std::shared_ptr<Slider> addSlider(
00076             const std::string& id,
00077             float x, float y,
00078             float width, float height,
00079             float minValue, float maxValue,
00080             float initialValue,
00081             const std::string& text,
00082             std::function<void(float)> onValueChanged
00083         );
00084
00085         std::shared_ptr<Slider> addSliderPercent(
00086             const std::string& id,
00087             float xPercent, float yPercent,
00088             float widthPercent, float heightPercent,
00089             float minValue, float maxValue,
00090             float initialValue,
00091             const std::string& text,
00092             std::function<void(float)> onValueChanged
00093         );
00094
00095         void clearElements();
00096
00097         void handleResize(int oldWidth, int oldHeight, int newWidth, int newHeight);
00098
00099         std::shared_ptr<Button> addButtonPercent(
00100             const std::string& id,
00101             float xPercent, float yPercent,
00102             float widthPercent, float heightPercent,
00103             const std::string& text,
00104             std::function<void()> callback
00105         );
00106
00107         std::shared_ptr<Button> addButtonPercent(
00108             const std::string& id,
00109             float xPercent, float yPercent,
00110             float widthPercent, float heightPercent,
00111             const std::string& text,
00112             std::function<void()> callback,
00113             Color32 normalColor,
00114             Color32 hoverColor,
00115             Color32 pressedColor,
00116             Color32 textColor
00117         );
00118
00119         std::shared_ptr<Text> addTextPercent(
00120             const std::string& id,
00121             float xPercent, float yPercent,
00122             const std::string& text,
00123             float fontSizePercent = 5.0f,
00124             Color32 color = CBLACK
00125         );
00126         std::shared_ptr<Image> addImage(
00127             const std::string& id,
00128             float x, float y,
00129             float width, float height,
00130             const std::string& imagePath
00131         );
00132
00133         std::shared_ptr<Image> addImage(
00134             const std::string& id,
00135             float x, float y,
00136             float width, float height,
00137             const std::string& imagePath,
00138             Color32 tint
00139         );
00140
00141         std::shared_ptr<Image> addImagePercent(
00142             const std::string& id,
00143             float xPercent, float yPercent,
00144             float widthPercent, float heightPercent,
00145             const std::string& imagePath
00146         );
00147
00148         std::shared_ptr<Image> addImagePercent(
00149             const std::string& id,
00150             float xPercent, float yPercent,
00151             float widthPercent, float heightPercent,
00152             const std::string& imagePath,
00153             Color32 tint
00154         );
```

```
00155
00156         std::shared_ptr<ImageButton> addImageButton(
00157             const std::string& id,
00158             float x, float y,
00159             float width, float height,
00160             const std::string& imagePath,
00161             std::function<void()> callback
00162         );
00163
00164         std::shared_ptr<ImageButton> addImageButton(
00165             const std::string& id,
00166             float x, float y,
00167             float width, float height,
00168             const std::string& imagePath,
00169             std::function<void()> callback,
00170             Color32 tint
00171         );
00172
00173         std::shared_ptr<ImageButton> addImageButtonPercent(
00174             const std::string& id,
00175             float xPercent, float yPercent,
00176             float widthPercent, float heightPercent,
00177             const std::string& imagePath,
00178             std::function<void()> callback
00179         );
00180
00181         std::shared_ptr<ImageButton> addImageButtonPercent(
00182             const std::string& id,
00183             float xPercent, float yPercent,
00184             float widthPercent, float heightPercent,
00185             const std::string& imagePath,
00186             std::function<void()> callback,
00187             Color32 tint
00188         );
00189
00190         std::shared_ptr<Checkbox> addCheckbox(
00191             const std::string& id,
00192             float x, float y,
00193             float width, float height,
00194             bool initialValue,
00195             std::function<void(bool)> callback
00196         );
00197
00198         std::shared_ptr<Checkbox> addCheckboxPercent(
00199             const std::string& id,
00200             float xPercent, float yPercent,
00201             float widthPercent, float heightPercent,
00202             bool initialValue,
00203             std::function<void(bool)> callback
00204         );
00205
00206                 float getWidth() const;
00207                 float getHeight() const;
00208
00209     private:
00210         std::shared_ptr<IAudio> _audio;
00211         std::unordered_map<std::string, std::shared_ptr<IUIElement» _elements;
00212 };
```

7.20 IContainers.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** IContainers
00006 */
00007
00008 #pragma once
00009
00010 #include <string>
00011 #include <memory>
00012 #include <vector>
00013 #include "../../../IDisplay.hpp"
00014
00015 class IContainers {
00016     public:
00017         virtual ~IContainers() = default;
00018
00019         virtual void draw() = 0;
00020
00021         virtual void update() = 0;
00022
00023         virtual void setPosition(float x, float y) = 0;
00024
```

```
00025         virtual void setSize(float width, float height) = 0;
00026
00027         virtual FloatRect getBounds() const = 0;
00028
00029         virtual bool contains(float x, float y) const = 0;
00030
00031         virtual void setVisible(bool visible) = 0;
00032
00033         virtual bool isVisible() const = 0;
00034 };
```

7.21 Help.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Help
00006 */
00007
00008 #pragma once
00009
00010 #include <memory>
00011 #include <string>
00012 #include "../Containers/Containers.hpp"
00013 #include "../../../IDisplay.hpp"
00014 #include "../../../Audio/IAudio.hpp"
00015
00016 class Help {
00017     public:
00018         Help(std::shared_ptr<IDisplay> display, std::shared_ptr<IAudio> audio);
00019
00020         ~Help() = default;
00021
00022         void show();
00023
00024         void hide();
00025
00026         bool isVisible() const;
00027
00028         bool containsPoint(float x, float y) const;
00029
00030         void update();
00031
00032         void draw();
00033
00034         void handleResize(int oldWidth, int oldHeight, int newWidth, int newHeight);
00035
00036     private:
00037         void initHelpContainer();
00038
00039         std::shared_ptr<IDisplay> _display;
00040         std::shared_ptr<IAudio> _audio;
00041         std::shared_ptr<Containers> _helpContainer;
00042         bool _visible;
00043 };
```

7.22 HUD.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** HUD
00006 */
00007
00008 #pragma once
00009
00010 #include <vector>
00011 #include <unordered_map>
00012 #include <memory>
00013 #include <string>
00014 #include <utility>
00015 #include <functional>
00016 #include <chrono>
00017 #include "Containers/Containers.hpp"
00018 #include "../../Game/GameInfos.hpp"
00019 #include "../../Audio/IAudio.hpp"
00020 #include "../../Utils/Constants.hpp"
00021 #include "Help/Help.hpp"
00022 #include "Settings/Settings.hpp"
00023 #include "../../IDisplay.hpp"
```

```
00024 #include "../../Observer/IObserver.hpp"
00025 #include "Graphic/Camera/CameraManager.hpp"
00026
00027 class HUD : public IObserver {
00028     public:
00029         HUD(std::shared_ptr<IDisplay> display, std::shared_ptr<GameInfos> gameInfos,
00030             std::shared_ptr<IAudio> audio,
00031             std::shared_ptr<CameraManager>,
00032             bool performanceMode,
00033             std::function<void()> resetCameraFunc = nullptr);
00034
00035         ~HUD();
00036
00037         void draw();
00038
00039         std::shared_ptr<Containers> addContainer(
00040             const std::string& id,
00041             float x, float y,
00042             float width, float height,
00043             Color32 backgroundColor = {40, 40, 40, 200}
00044         );
00045
00046         std::shared_ptr<Containers> getContainer(const std::string& id) const;
00047
00048         bool removeContainer(const std::string& id);
00049
00050         void handleResize(int oldWidth, int oldHeight, int newWidth, int newHeight);
00051
00052         void clearAllContainers();
00053
00054         void initDefaultLayout(float sideWidthPercent = 15.0f,
00055             float bottomHeightPercent = 20.0f);
00056
00057         std::shared_ptr<Containers> getSideContainer() const;
00058
00059         std::shared_ptr<Containers> getBottomContainer() const;
00060
00061         std::shared_ptr<Containers> getSquareContainer() const;
00062
00063         std::shared_ptr<Containers> getTpsContainer() const;
00064
00065         std::shared_ptr<Containers> getSecurityContainer() const;
00066
00067         std::shared_ptr<Containers> getServerMessagesContainer() const;
00068
00069         std::shared_ptr<Containers> getMapInfoContainer() const;
00070
00071         void initExitButton();
00072
00073         void initSettingsButton();
00074
00075         void initHelpButton();
00076
00077         void initCameraResetButton();
00078
00079         void initTeamPlayersDisplay(std::shared_ptr<GameInfos> gameInfos);
00080
00081         void updateTeamPlayersDisplay(std::shared_ptr<GameInfos> gameInfos);
00082
00083         void initTpsSlider(std::shared_ptr<GameInfos> gameInfos,
00084             std::shared_ptr<IDisplay> raylib, std::shared_ptr<IAudio> audio);
00085
00086         void updateTpsSlider(std::shared_ptr<GameInfos> gameInfos);
00087
00088         void initServerMessagesDisplay(std::shared_ptr<GameInfos> gameInfos);
00089
00090         void updateServerMessagesDisplay(std::shared_ptr<GameInfos> gameInfos);
00091
00092         void initPlayerInventoryDisplay(int playerId);
00093
00094         void updatePlayerInventoryDisplay(int playerId, zappy::gui::CameraMode cameraMode);
00095
00096         void updateHelpInformationHUD(zappy::gui::CameraMode cameraMode);
00097
00098         void clearPlayerInventoryElements();
00099
00100         void setSelectedTile(int x, int y);
00101
00102         void initTileResourceDisplay();
00103
00104         void updateTileResourceDisplay(int x, int y);
00105
00106         void clearTileResourceElements();
00107
00108         void initFpsDisplay();
00109
00110         void updateFpsDisplay();
```

```
00111
00112         void initMapInfoDisplay();
00113
00114         void initMapInfoButton();
00115
00116         void updateMapInfoDisplay();
00117
00118         zappy::structs::Player getPlayerById(int playerId) const;
00119
00120         bool isPlayerInIncantation(int playerId) const;
00121
00122         void setResetCameraCallback(std::function<void()> resetFunc);
00123
00124         void displayWinMessage(const std::string& teamName);
00125
00126         void update() override;
00127         void onGameEvent(GameEventType eventType, const std::string& teamName) override;
00128
00129         bool isMouseOverHUD() const;
00130
00131     private:
00132         void _initHelpInformation();
00133
00134         std::string _camModeToText(zappy::gui::CameraMode, bool isGamePadAvailable);
00135
00136         std::string _camKeyHelp(zappy::gui::CameraMode, bool isGamePadAvailable);
00137
00138         std::string _mapGlobalInfo(std::shared_ptr<GameInfos> gameInfos);
00139
00140         std::shared_ptr<Containers> createSquareContainer(float squareSize,
00141             float sideWidthPercent);
00142
00143         std::shared_ptr<Containers> createSideContainer(
00144             float sideYStart,
00145             float sideWidth,
00146             float sideHeight,
00147             float sideWidthPercent,
00148             float bottomHeightPercent);
00149
00150         std::shared_ptr<Containers> createBottomContainer(
00151             int screenWidth,
00152             int screenHeight,
00153             float bottomHeight,
00154             float bottomHeightPercent);
00155
00156         std::shared_ptr<Containers> createTpsContainer(
00157             int screenWidth,
00158             int screenHeight,
00159             float bottomHeight,
00160             float bottomHeightPercent);
00161
00162         std::shared_ptr<Containers> createSecurityContainer(
00163             int screenWidth,
00164             int screenHeight,
00165             float bottomHeight,
00166             float bottomHeightPercent);
00167
00168         std::shared_ptr<Containers> createServerMessagesContainer(
00169             int screenWidth,
00170             int screenHeight,
00171             float bottomHeight,
00172             float bottomHeightPercent);
00173
00174         std::shared_ptr<Containers> createMapInfoContainer();
00175
00176         void updateElementPositions(
00177             std::shared_ptr<Containers> container,
00178             const std::unordered_map<std::string, float>& initialYPositions,
00179             float offset);
00180
00181         std::pair<float, float> calculateContentMetrics(
00182             std::shared_ptr<Containers> container,
00183             const std::unordered_map<std::string, float>& initialYPositions);
00184
00185         void clearTeamDisplayElements(std::shared_ptr<Containers> container);
00186
00187         std::vector<int> getTeamPlayerNumbers(const std::string& teamName,
00188             const std::vector<zappy::structs::Player>& players);
00189
00190         std::string createPlayerListText(const std::vector<int>& playerNumbers);
00191
00192         void addPlayerListText(std::shared_ptr<Containers> container,
00193                                const std::string& teamId,
00194                                float yPos, const std::vector<int>& playerNumbers);
00195
00196         void addIncrementDecrementButtons(std::shared_ptr<Containers> container, int playerId);
00197
```

```
00198         void updateTeamHoverDetection();
00199         void createTeamDetailsContainer();
00200         void showTeamDetailsContainer(const std::string& teamName);
00201         void hideTeamDetailsContainer();
00202
00203         std::unordered_map<std::string, std::shared_ptr<Containers» _containers;
00204         std::shared_ptr<IDisplay> _display;
00205         std::shared_ptr<GameInfos> _gameInfos;
00206         std::shared_ptr<IAudio> _audio;
00207         std::shared_ptr<CameraManager> _camera;
00208         bool _performanceMode;
00209         std::shared_ptr<Help> _help;
00210         std::shared_ptr<Settings> _settings;
00211         std::function<void()> _resetCameraFunc;
00212         bool _showVictoryMessage;
00213         std::string _winningTeam;
00214         Color32 _victoryColor;
00215         std::pair<int, int> _selectedTile;
00216
00217         std::string _hoveredTeam;
00218         std::shared_ptr<Containers> _teamDetailsContainer;
00219         bool _mapInfoButtonHovered;
00220 };
```

7.23 Image.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Image
00006 */
00007
00008 #pragma once
00009
00010 #include <string>
00011 #include <memory>
00012
00013 #include "../UIElement/AUIElement.hpp"
00014 #include "../../../IDisplay.hpp"
00015
00016 class Image : public AUIElement {
00017     public:
00018         Image(
00019             std::shared_ptr<IDisplay> display,
00020             float x, float y,
00021             float width, float height,
00022             const std::string& imagePath
00023         );
00024
00025         ~Image() override = default;
00026
00027         void draw() override;
00028
00029         void update() override;
00030
00031         void setImagePath(const std::string& imagePath);
00032
00033         std::string getImagePath() const;
00034
00035         void setTint(Color32 tint);
00036
00037         Color32 getTint() const;
00038
00039         void setSize(float width, float height) override;
00040
00041         void setMaintainAspectRatio(bool maintain);
00042
00043         bool getMaintainAspectRatio() const;
00044
00045     private:
00046         std::string _imagePath;
00047         Color32 _tint;
00048         bool _maintainAspectRatio;
00049         bool _imageLoaded;
00050
00051         void loadImage();
00052 };
```

7.24 ImageButton.hpp

```
00001 /*
```

```
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** ImageButton
00006 */
00007
00008 #pragma once
00009
00010 #include <functional>
00011 #include <string>
00012 #include <memory>
00013 #include "../Image/Image.hpp"
00014 #include "../../../Audio/IAudio.hpp"
00015
00016 class ImageButton : public Image {
00017     public:
00018         ImageButton(
00019             std::shared_ptr<IDisplay> display,
00020             std::shared_ptr<IAudio> audio,
00021             float x, float y,
00022             float width, float height,
00023             const std::string& imagePath,
00024             std::function<void()> callback
00025         );
00026
00027         ~ImageButton() override = default;
00028
00029         void update() override;
00030
00031         void setCallback(std::function<void()> callback);
00032
00033         std::function<void()> getCallback() const;
00034
00035     private:
00036         std::function<void()> _callback;
00037         std::shared_ptr<IAudio> _audio;
00038         bool _isHovered;
00039         bool _isPressed;
00040 };
```

7.25 Settings.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** zappy
00004 ** File description:
00005 ** Settings
00006 */
00007
00008 #ifndef SETTINGS_HPP_
00009 #define SETTINGS_HPP_
00010 #include <memory>
00011 #include "../Containers/Containers.hpp"
00012 #include "../../../IDisplay.hpp"
00013 #include  "../../../Audio/IAudio.hpp"
00014 #include "Graphic/Camera/CameraManager.hpp"
00015 #include "../../../Game/GameInfos.hpp"
00016
00017 class Settings {
00018     private:
00019         std::shared_ptr<IDisplay> _display;
00020         std::shared_ptr<IAudio> _audio;
00021         std::shared_ptr<CameraManager> _camera;
00022         std::shared_ptr<GameInfos> _gameInfos;
00023         float _sfxLevel;
00024         float _musicLevel;
00025         float _cameraMovingSpeed;
00026         float _cameraRotaSpeed;
00027         float _cameraZoomSpeed;
00028         std::shared_ptr<Containers> _settingsContainer;
00029         bool _visible;
00030
00031     public:
00032         bool isVisible() const;
00033
00034         bool containsPoint(float x, float y) const;
00035
00036         void show();
00037
00038         void hide();
00039
00040         void update();
00041
00042         void draw();
00043
```

```
00044         void handleResize(int oldWidth, int oldHeight, int newWidth, int newHeight);
00045
00046         Settings(
00047             std::shared_ptr<IDisplay> display,
00048             std::shared_ptr<IAudio> audio,
00049             std::shared_ptr<CameraManager> camera,
00050             std::shared_ptr<GameInfos> gameInfos
00051         );
00052         ~Settings();
00053 };
00054
00055 #endif /* !SETTINGS_HPP_ */
```

7.26 Slider.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Slider
00006 */
00007
00008 #ifndef SLIDER_HPP_
00009 #define SLIDER_HPP_
00010
00011 #include <string>
00012 #include <functional>
00013 #include <memory>
00014
00015 #include "../../../IDisplay.hpp"
00016 #include "../UIElement/AUIElement.hpp"
00017
00018 class Slider : public AUIElement {
00019     public:
00020         Slider(
00021             std::shared_ptr<IDisplay> raylib,
00022             float x, float y,
00023             float width, float height,
00024             float minValue, float maxValue,
00025             float initialValue,
00026             const std::string& text,
00027             std::function<void(float)> onValueChanged
00028         );
00029
00030         ~Slider() override = default;
00031
00032         void draw() override;
00033         void update() override;
00034         bool isDragging() const;
00035
00036         void setValue(float value);
00037         float getValue() const;
00038         void setMinValue(float minValue);
00039         void setMaxValue(float maxValue);
00040         float getMinValue() const;
00041         float getMaxValue() const;
00042         void setText(const std::string& text);
00043         std::string getText() const;
00044
00045         void setSize(float width, float height) override;
00046
00047     private:
00048         float _value;
00049         float _minValue;
00050         float _maxValue;
00051         std::string _text;
00052         std::function<void(float)> _onValueChanged;
00053
00054         bool _isDragging;
00055         float _sliderTrackWidth;
00056         float _sliderHandleRadius;
00057
00058         Color32 _trackColor;
00059         Color32 _fillColor;
00060         Color32 _handleColor;
00061         Color32 _textColor;
00062
00063         void updateValueFromMousePosition(float mouseX);
00064         float getHandlePosition() const;
00065         bool isMouseOverHandle(float mouseX, float mouseY) const;
00066         bool isMouseOverTrack(float mouseX, float mouseY) const;
00067 };
00068
00069 #endif /* !SLIDER_HPP_ */
```

7.27 Text.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Text
00006 */
00007
00008 #pragma once
00009
00010 #include <memory>
00011 #include <string>
00012
00013 #include "../UIElement/AUIElement.hpp"
00014 #include "../../../IDisplay.hpp"
00015
00016 class Text : public AUIElement {
00017     public:
00018         Text(
00019             std::shared_ptr<IDisplay> raylib,
00020             float x, float y,
00021             const std::string& text,
00022             float fontSize = 20.0f,
00023             Color32 color = CBLACK
00024         );
00025
00026         ~Text() override = default;
00027
00028         void draw() override;
00029
00030         void update() override;
00031
00032         void setText(const std::string& text);
00033
00034         std::string getText() const;
00035
00036         void setFontSize(float fontSize);
00037
00038         float getFontSize() const;
00039
00040         void setColor(Color32 color);
00041
00042         Color32 getColor() const;
00043
00044         void setSize(float width, float height) override;
00045
00046         float getWidth() const;
00047         void setX(float x);
00048         void setY(float y);
00049
00050     private:
00051         std::string _text;
00052         float _fontSize;
00053         Color32 _color;
00054         std::shared_ptr<IDisplay> _display;
00055 };
```

7.28 AUIElement.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** AUIElement
00006 */
00007
00008 #pragma once
00009
00010 #include <memory>
00011 #include "IUIElement.hpp"
00012
00013 struct UIRelativePosition {
00014     float xPercent;
00015     float yPercent;
00016     float widthPercent;
00017     float heightPercent;
00018 };
00019
00020 class AUIElement : public IUIElement {
00021     public:
00022         AUIElement(std::shared_ptr<IDisplay> display, float x, float y, float width,
00023             float height);
00024
```

```
00025         virtual ~AUIElement() = default;
00026
00027         // IUIElement implementation
00028         void setPosition(float x, float y) override;
00029         FloatRect getBounds() const override;
00030         bool contains(float x, float y) const override;
00031         void setVisible(bool visible) override;
00032         bool isVisible() const override;
00033
00034         virtual void setSize(float width, float height);
00035
00036         void setRelativePosition(float xPercent, float yPercent, float widthPercent,
00037             float heightPercent);
00038
00039         UIRelativePosition getRelativePosition() const;
00040
00041     protected:
00042         std::shared_ptr<IDisplay> _display;
00043         FloatRect _bounds;
00044         UIRelativePosition _relativePos;
00045         bool _visible;
00046 };
```

7.29 IUIElement.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** IUIElement
00006 */
00007
00008 #pragma once
00009
00010 #include "../../../IDisplay.hpp"
00011
00012 class IUIElement {
00013     public:
00014         virtual ~IUIElement() = default;
00015
00016         virtual void draw() = 0;
00017
00018         virtual void update() = 0;
00019
00020         virtual void setPosition(float x, float y) = 0;
00021
00022         virtual void setSize(float width, float height) = 0;
00023
00024         virtual FloatRect getBounds() const = 0;
00025
00026         virtual bool contains(float x, float y) const = 0;
00027
00028         virtual void setVisible(bool visible) = 0;
00029
00030         virtual bool isVisible() const = 0;
00031 };
```

7.30 Map.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Map
00006 */
00007
00008 #ifndef MAP_HPP_
00009 #define MAP_HPP_
00010
00011 #include <memory>
00012 #include <unordered_map>
00013 #include <vector>
00014 #include <string>
00015 #include <chrono>
00016 #include <mutex>
00017 #include "../Game/GameInfos.hpp"
00018 #include "../IDisplay.hpp"
00019
00020 enum class DisplayPriority {
00021     TILE = 0,
00022     EGG = 1,
00023     PLAYER = 2,
```

```
00024     FOOD = 3,
00025     ROCK = 4,
00026 };
00027
00028 struct PlayerRotationState {
00029     float currentRotation;
00030     float targetRotation;
00031     bool isRotating;
00032     std::chrono::steady_clock::time_point lastUpdateTime;
00033
00034     PlayerRotationState() : currentRotation(0.0f), targetRotation(0.0f),
00035                     isRotating(false), lastUpdateTime(std::chrono::steady_clock::now()) {}
00036 };
00037
00038 struct PlayerPositionState {
00039     Vector3f currentPosition;
00040     Vector3f targetPosition;
00041     bool isMoving;
00042     std::chrono::steady_clock::time_point lastUpdateTime;
00043
00044     PlayerPositionState() : currentPosition({0.0f, 0.0f, 0.0f}),
00045                     targetPosition({0.0f, 0.0f, 0.0f}),
00046                     isMoving(false), lastUpdateTime(std::chrono::steady_clock::now()) {}
00047 };
00048
00049 class Map {
00050     public:
00051         Map(std::shared_ptr<GameInfos> gameInfos, std::shared_ptr<IDisplay> display);
00052         ~Map();
00053
00054         void draw(bool performanceMode = false);
00055         void drawBroadcastingPlayers();
00056         void drawIncantations();
00057
00058         void drawTile(int x, int y, const zappy::structs::Tile &tile);
00059         void drawPerformanceTile(const zappy::structs::Tile &tile);
00060
00061         void drawRock(int x, int y, const zappy::structs::Tile &tile);
00062         void drawPerformanceRock(int x, int y, const zappy::structs::Tile &tile);
00063
00064         void drawFood(int x, int y, const zappy::structs::Tile &tile);
00065         void drawPerformanceFood(int x, int y, const zappy::structs::Tile &tile);
00066
00067         void drawAllPlayers();
00068         void drawEggs(int x, int y);
00069
00070         float getOffset(DisplayPriority priority, int x, int y, size_t stackIndex = 0);
00071         void updatePlayerRotations();
00072         float getPlayerInterpolatedRotation(int playerId, int serverOrientation);
00073         void updatePlayerPositions();
00074         Vector3f getPlayerInterpolatedPosition(int playerId, int serverX, int serverY);
00075
00076     private:
00077         std::shared_ptr<GameInfos> _gameInfos;
00078         std::shared_ptr<IDisplay> _display;
00079
00080         std::unordered_map<int, std::chrono::steady_clock::time_point> _broadcastStartTimes;
00081         std::unordered_map<int, PlayerRotationState> _playerRotations;
00082         std::unordered_map<int, PlayerPositionState> _playerPositions;
00083
00084         mutable std::mutex _playerStatesMutex;
00085
00086         static constexpr float BASE_HEIGHT_TILE = 0.0f;
00087
00088         static constexpr float BASE_HEIGHT_PLAYER = 0.0f;
00089         static constexpr float PLAYER_HEIGHT = 0.95f;
00090
00091         static constexpr float BASE_HEIGHT_EGG = 0.0f;
00092         static constexpr float EGG_HEIGHT = 0.2f;
00093
00094         static constexpr float BASE_HEIGHT_FOOD = 0.1f;
00095         static constexpr float FOOD_HEIGHT = 0.7f;
00096
00097         static constexpr float BASE_HEIGHT_ROCK = 0.1f;
00098         static constexpr float ROCK_HEIGHT = 0.7f;
00099
00100
00101         void drawTorus(const Vector3f &position, float radius, float thickness,
00102             int radialSegments, Color32 color);
00103         float orientationToRotation(int orientation);
00104         float normalizeAngle(float angle);
00105         float getShortestAngleDifference(float from, float to);
00106         Vector3f calculatePlayerWorldPosition(int x, int y);
00107         float getDistance(const Vector3f& from, const Vector3f& to);
00108         Vector3f lerpVector3f(const Vector3f& from, const Vector3f& to, float t);
00109
00110         bool _performanceMode = false;
```

```
00111 };
00112
00113 #endif /* !MAP_HPP_ */
```

7.31 SplashScreen.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** SplashScreen
00006 */
00007
00008 #ifndef SPLASHSCREEN_HPP_
00009 #define SPLASHSCREEN_HPP_
00010
00011 #include <memory>
00012 #include <string>
00013 #include <vector>
00014 #include "../IDisplay.hpp"
00015
00016 class SplashScreen {
00017     public:
00018         SplashScreen(std::shared_ptr<IDisplay> display);
00019         ~SplashScreen();
00020
00021         void show();
00022         void update(float deltaTime);
00023         void draw();
00024         void setLoadingProgress(float progress);
00025         void setLoadingText(const std::string& text);
00026         void finish();
00027
00028     private:
00029         void _drawBackground();
00030         void _drawLoadingBar();
00031         void _drawLoadingText();
00032         void _drawZappyLogo();
00033
00034         std::shared_ptr<IDisplay> _display;
00035         float _currentTime;
00036         float _fadeAlpha;
00037         float _logoScale;
00038         float _loadingProgress;
00039         std::string _loadingText;
00040         bool _finished;
00041         bool _logoLoaded;
00042
00043         int _windowWidth;
00044         int _windowHeight;
00045 };
00046
00047 #endif /* !SPLASHSCREEN_HPP_ */
```

7.32 IDisplay.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** zappy
00004 ** File description:
00005 ** IDisplay
00006 */
00007
00008 #ifndef IDISPLAY_HPP_
00009 #define IDISPLAY_HPP_
00010 #include <utility>
00011 #include <string>
00012 #include "Utils/InputType.hpp"
00013
00014 enum Key {
00015     TAB,
00016     ESC,
00017     UP,
00018     DOWN,
00019     RIGHT,
00020     LEFT,
00021     H,
00022     C,
00023     GM_PD_LEFT_SHOULDER,
00024     GM_PD_RIGHT_SHOULDER,
00025     GM_PD_LEFT_TRIGGER,
00026     GM_PD_RIGHT_TRIGGER,
```

```
00027     GM_PD_UP,
00028     GM_PD_DOWN,
00029     GM_PD_AXIS_RIGHT_X,
00030     GM_PD_AXIS_RIGHT_Y,
00031     GM_PD_H,
00032     MOUSE_LEFT,
00033     MOUSE_RIGHT,
00034 };
00035
00036 typedef struct Vector3f {
00037     float x;
00038     float y;
00039     float z;
00040
00041     bool operator==(const Vector3f& other) const {
00042         return x == other.x && y == other.y && z == other.z;
00043     }
00044
00045     bool operator!=(const Vector3f& other) const {
00046         return !(*this == other);
00047     }
00048 } Vector3f;
00049
00050 typedef struct Vector2f {
00051     float x;
00052     float y;
00053 } Vector2f;
00054
00055 typedef struct Vector2i {
00056     int x;
00057     int y;
00058 } Vector2i;
00059
00060 typedef struct Color32 {
00061     unsigned char r;
00062     unsigned char g;
00063     unsigned char b;
00064     unsigned char a;
00065 } Color32;
00066
00067 typedef struct FloatRect {
00068     float x;
00069     float y;
00070     float width;
00071     float height;
00072 } FloatRect;
00073
00074 typedef struct IntRect {
00075     int x;
00076     int y;
00077     int width;
00078     int height;
00079 } IntRect;
00080
00081 typedef struct Ray3D {
00082     Vector3f position;
00083     Vector3f direction;
00084 } Ray3D;
00085
00086 typedef struct RayCollision3D {
00087     bool hit;
00088     float distance;
00089     Vector3f point;
00090     Vector3f normal;
00091 } RayCollision3D;
00092
00093 typedef struct BoundingBox3D {
00094     Vector3f min;
00095     Vector3f max;
00096 } BoundingBox3D;
00097
00098 #define COLOR(r, g, b) Color32{ r, g, b, 255 }
00099 #define CLIGHTGRAY COLOR(200, 200, 200)
00100 #define CBLACK COLOR(0, 0, 0)
00101 #define CRED COLOR(230, 41, 55)
00102 #define CBROWN COLOR(127, 106, 79)
00103 #define CBLUE COLOR(0, 121, 241)
00104 #define CWHITE COLOR(255, 255, 255)
00105
00106 #define CRAYWHITE COLOR(245, 245, 245)
00107 #define CPINK COLOR(255, 109, 194)
00108 #define CGREEN COLOR(0, 228, 48)
00109 #define CMAROON COLOR(190, 33, 55)
00110 #define CPURPLE COLOR(200, 122, 255)
00111 #define CORANGE COLOR(255, 161, 0)
00112 #define CYELLOW COLOR(253, 249, 0)
00113
```

```
00114 class IDisplay {
00115     public:
00116         virtual Vector2i getMonitorSize() = 0;
00117         virtual Vector2i getScreenSize() = 0;
00118 
00119         virtual void initWindow(int width, int height, std::string) = 0;
00120         virtual void initCamera() = 0;
00121 
00122         virtual bool isWindowReady() = 0;
00123         virtual void setTargetFPS(unsigned int FPS) = 0;
00124 
00125         virtual bool isOpen() = 0;
00126         virtual void closeWindow() = 0;
00127 
00128         virtual int getKeyId(enum Key) = 0;
00129 
00130         virtual bool isKeyReleased(int key) = 0;
00131         virtual bool isKeyPressed(int key) = 0;
00132         virtual bool isKeyDown(int key) = 0;
00133 
00134         virtual bool isGamepadAvailable() = 0;
00135 
00136         virtual bool isGamepadButtonReleased(int key) = 0;
00137         virtual bool isGamepadButtonPressed(int key) = 0;
00138         virtual bool isGamepadButtonDown(int key) = 0;
00139 
00140         virtual bool isMouseButtonDown(int key) = 0;
00141         virtual bool isMouseButtonReleased(int key) = 0;
00142         virtual bool isMouseButtonPressed(int key) = 0;
00143 
00144         virtual Vector2f getMousePosition() = 0;
00145         virtual void setMousePosition(Vector2f) = 0;
00146 
00147         virtual float getMouseWheelMove() = 0;
00148 
00149         virtual float getGamepadAxisMovement(int key) = 0;
00150 
00151         virtual void setCameraPosition(Vector3f) = 0;
00152 
00153         virtual void setCameraTarget(Vector3f) = 0;
00154 
00155         virtual Vector2f getMouseDelta() = 0;
00156 
00157         virtual float vector3DDistanceFromCamera(Vector3f target) = 0;
00158         virtual Vector3f vector3SubtractFromCamera(Vector3f target) = 0;
00159 
00160         virtual Vector3f vector3Normalize(Vector3f) = 0;
00161 
00162 
00163         virtual void enableCursor() = 0;
00164         virtual void disableCursor() = 0;
00165 
00166         virtual float getFrameTime() = 0;
00167         virtual int getFPS() = 0;
00168 
00169         virtual void updateCameraFreeMode(float camMovingSpeed, float camRotaSpeed) = 0;
00170 
00171         virtual InputType getLastInputType() const = 0;
00172         virtual void updateLastInputType() = 0;
00173 
00174         virtual float measureText(const std::string& text, float fontSize) const = 0;
00175 
00176         virtual bool checkCollisionPointRec(Vector2f point, FloatRect rec) = 0;
00177 
00178         virtual Ray3D getMouseRay(Vector2f mousePosition) = 0;
00179         virtual RayCollision3D getRayCollisionBox(Ray3D ray, BoundingBox3D box) = 0;
00180         virtual RayCollision3D getRayCollisionSphere(Ray3D ray, Vector3f center,
00181             float radius) = 0;
00182         virtual bool checkCollisionBoxes(BoundingBox3D box1, BoundingBox3D box2) = 0;
00183 
00184         virtual Ray3D getMouseRayFromCurrent() = 0;
00185         virtual BoundingBox3D createBoundingBox(Vector3f center, Vector3f size) = 0;
00186         virtual BoundingBox3D createBoundingBoxFromMinMax(Vector3f min, Vector3f max) = 0;
00187 
00188         virtual void beginDrawing() = 0;
00189         virtual void endDrawing() = 0;
00190         virtual void clearBackground(Color32) = 0;
00191 
00192         virtual void begin3DMode() = 0;
00193         virtual void end3DMode() = 0;
00194 
00195         virtual void endScissorMode() = 0;
00196         virtual void beginScissorMode(IntRect) = 0;
00197 
00198         virtual bool loadModel(const std::string& id, const std::string& filepath,
00199             Vector3f center = {0.0f, 0.0f, 0.0f}) = 0;
00200 
```

```
00201         virtual void drawCube(Vector3f position, float width, float height, float length,
00202             Color32 color) = 0;
00203         virtual void drawCubeWires(Vector3f position, float width, float height, float length,
00204             Color32 color) = 0;
00205
00206         virtual void drawSphere(Vector3f position, float radius, Color32 color) = 0;
00207         virtual void drawSphereWires(Vector3f position, float radius, int rings, int slices,
00208             Color32 color) = 0;
00209
00210         virtual void drawCylinder(Vector3f position, float radiusTop, float radiusBottom,
00211             float height, int slices, Color32 color) = 0;
00212         virtual void drawCylinderWires(Vector3f position, float radiusTop, float radiusBottom,
00213             float height, int slices, Color32 color) = 0;
00214         virtual void drawCylinderEx(Vector3f startPos, Vector3f endPos, float startRadius,
00215             float endRadius, int sides, Color32 color) = 0;
00216
00217         virtual void drawPlane(Vector3f position, Vector2f size, Color32 color) = 0;
00218
00219         virtual void drawLine3D(Vector3f startPos, Vector3f endPos, Color32 color) = 0;
00220
00221         virtual void drawModelEx(const std::string& id, Vector3f position,
00222             Vector3f rotationAxis, float rotationAngle, Vector3f scale,
00223             Color32 tint = CWHITE) = 0;
00224
00225         virtual void drawCircle(float centerX, float centerY, float radius,
00226             Color32 color) = 0;
00227         virtual void drawCircleLines(float centerX, float centerY, float radius,
00228             Color32 color) = 0;
00229
00230         virtual void drawText(const std::string& text, float x, float y, float fontSize,
00231             Color32 color) = 0;
00232
00233         virtual void drawTextEx(const std::string& text, float x, float y, float fontSize,
00234             float spacing, Color32 color) = 0;
00235
00236         virtual void drawRectangleRec(FloatRect rec, Color32 color) = 0;
00237
00238         virtual bool loadTexture(const std::string& id, const std::string& filepath) = 0;
00239
00240         virtual bool loadFont(const std::string& id, const std::string& filepath) = 0;
00241
00242         virtual void drawTexture(const std::string& id, float x, float y,
00243             Color32 tint = CWHITE) = 0;
00244
00245         virtual void drawTextureScaled(const std::string& id, float x, float y, float width,
00246             float height, Color32 tint = CWHITE) = 0;
00247
00248         virtual Vector2f getTextureSize(const std::string& id) const = 0;
00249
00250         virtual bool loadSkybox(const std::string& id, const std::string& filepath) = 0;
00251
00252         virtual void drawSkybox(const std::string& id) = 0;
00253
00254         virtual float getTime() const = 0;
00255
00256         ~IDisplay() = default;
00257 };
00258
00259 #endif /* !IDISPLAY_HPP_ */
```

7.33 GuiObserver.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** GuiObserver
00006 */
00007
00008 #ifndef GUIOBSERVER_HPP_
00009 #define GUIOBSERVER_HPP_
00010
00011 #include <memory>
00012 #include <string>
00013 #include "IObserver.hpp"
00014
00015 class GUI;
00016
00017 class GuiObserver : public IObserver {
00018     public:
00019         GuiObserver(std::shared_ptr<GUI> gui);
00020         virtual ~GuiObserver() = default;
00021
00022         void update() override;
00023         void onGameEvent(GameEventType eventType, const std::string& teamName) override;
```

```
00024
00025     private:
00026         std::weak_ptr<GUI> _gui;
00027 };
00028
00029 #endif /* !GUIOBSERVER_HPP_ */
```

7.34 IObserver.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** IObserver
00006 */
00007
00008 #ifndef IOBSERVER_HPP_
00009 #define IOBSERVER_HPP_
00010
00011 #include <string>
00012
00013 enum class GameEventType {
00014     STATE_CHANGED,
00015     TEAM_WIN,
00016     TEAM_DEFEAT
00017 };
00018
00019 class IObserver {
00020     public:
00021         virtual ~IObserver() = default;
00022         virtual void update() = 0;
00023         virtual void onGameEvent(GameEventType eventType, const std::string& teamName) {
00024             (void)eventType;
00025             (void)teamName;
00026         }
00027 };
00028
00029 #endif /* !IOBSERVER_HPP_ */
```

7.35 ISubject.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** ISubject
00006 */
00007
00008 #ifndef ISUBJECT_HPP_
00009 #define ISUBJECT_HPP_
00010
00011 #include <vector>
00012 #include <memory>
00013 #include <string>
00014 #include "IObserver.hpp"
00015
00016 class ISubject {
00017     public:
00018         virtual ~ISubject() = default;
00019         virtual void addObserver(std::shared_ptr<IObserver> observer) = 0;
00020         virtual void removeObserver(std::shared_ptr<IObserver> observer) = 0;
00021         virtual void notifyObservers() = 0;
00022         virtual void notifyGameEvent(GameEventType eventType, const std::string& teamName) = 0;
00023
00024     protected:
00025         std::vector<std::weak_ptr<IObserver» _observers;
00026 };
00027
00028 #endif /* !ISUBJECT_HPP_ */
```

7.36 Subject.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Subject
00006 */
00007
```

```
00008 #include <algorithm>
00009 #include <memory>
00010 #include <vector>
00011 #include <string>
00012 #include <mutex>
00013
00014 #include "ISubject.hpp"
00015
00016 #ifndef SUBJECT_HPP_
00017 #define SUBJECT_HPP_
00018
00019 class Subject : public ISubject {
00020     public:
00021         virtual ~Subject() = default;
00022
00023         void addObserver(std::shared_ptr<IObserver> observer) override;
00024
00025         void removeObserver(std::shared_ptr<IObserver> observer) override;
00026
00027         void notifyObservers() override;
00028
00029         void notifyGameEvent(GameEventType eventType, const std::string& teamName);
00030
00031     private:
00032         std::vector<std::weak_ptr<IObserver» _observers;
00033         mutable std::mutex _observersMutex;
00034 };
00035
00036 #endif /* !SUBJECT_HPP_ */
```

7.37 Raylib.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** zappy
00004 ** File description:
00005 ** Raylib
00006 */
00007
00008 #ifndef RAYLIB_HPP_
00009 #define RAYLIB_HPP_
00010 #include <memory>
00011 #include <string>
00012 #include "../IDisplay.hpp"
00013 #include "RaylibEnc/RayLibEnc.hpp"
00014
00015 class Raylib : public IDisplay {
00016     private:
00017         std::unique_ptr<RayLibEnc> _raylib;
00018
00019     public:
00020         virtual Vector2i getMonitorSize();
00021         virtual Vector2i getScreenSize();
00022
00023         virtual void initWindow(int width, int height, std::string);
00024         virtual void initCamera();
00025
00026         virtual bool isWindowReady();
00027         virtual void setTargetFPS(unsigned int FPS);
00028
00029         virtual bool isOpen();
00030         virtual void closeWindow();
00031
00032         virtual int getKeyId(enum Key);
00033
00034         virtual bool isKeyReleased(int key);
00035         virtual bool isKeyPressed(int key);
00036         virtual bool isKeyDown(int key);
00037
00038         virtual bool isGamepadAvailable();
00039
00040         virtual bool isGamepadButtonReleased(int key);
00041         virtual bool isGamepadButtonPressed(int key);
00042         virtual bool isGamepadButtonDown(int key);
00043
00044
00045         virtual bool isMouseButtonDown(int key);
00046         virtual bool isMouseButtonReleased(int key);
00047         virtual bool isMouseButtonPressed(int key);
00048
00049         virtual Vector2f getMousePosition();
00050         virtual void setMousePosition(Vector2f);
00051
00052         virtual float getMouseWheelMove();
00053
```

```
00054         virtual float getGamepadAxisMovement(int key);
00055
00056         virtual void setCameraPosition(Vector3f);
00057
00058         virtual void setCameraTarget(Vector3f);
00059
00060         virtual Vector2f getMouseDelta();
00061
00062         virtual float vector3DDistanceFromCamera(Vector3f target);
00063         virtual Vector3f vector3SubtractFromCamera(Vector3f target);
00064
00065         virtual Vector3f vector3Normalize(Vector3f);
00066
00067         virtual void enableCursor();
00068         virtual void disableCursor();
00069
00070         virtual float getFrameTime();
00071         virtual int getFPS();
00072
00073         virtual void updateCameraFreeMode(float camMovingSpeed, float camRotaSpeed);
00074
00075         virtual InputType getLastInputType() const;
00076         virtual void updateLastInputType();
00077
00078         virtual float measureText(const std::string& text, float fontSize) const;
00079
00080         virtual bool checkCollisionPointRec(Vector2f point, FloatRect rec);
00081
00082         virtual Ray3D getMouseRay(Vector2f mousePosition);
00083         virtual RayCollision3D getRayCollisionBox(Ray3D ray, BoundingBox3D box);
00084         virtual RayCollision3D getRayCollisionSphere(Ray3D ray, Vector3f center, float radius);
00085         virtual bool checkCollisionBoxes(BoundingBox3D box1, BoundingBox3D box2);
00086
00087         virtual Ray3D getMouseRayFromCurrent();
00088         virtual BoundingBox3D createBoundingBox(Vector3f center, Vector3f size);
00089         virtual BoundingBox3D createBoundingBoxFromMinMax(Vector3f min, Vector3f max);
00090
00091         virtual void beginScissorMode(IntRect);
00092         virtual void endScissorMode();
00093
00094         virtual void beginDrawing();
00095         virtual void endDrawing();
00096
00097         virtual void clearBackground(Color32);
00098
00099         virtual void begin3DMode();
00100         virtual void end3DMode();
00101
00102         virtual bool loadModel(const std::string& id, const std::string& filepath,
00103             Vector3f center = {0.0f, 0.0f, 0.0f});
00104
00105         virtual void drawCube(Vector3f position, float width, float height, float length,
00106             Color32 color);
00107         virtual void drawCubeWires(Vector3f position, float width, float height, float length,
00108             Color32 color);
00109
00110         virtual void drawSphere(Vector3f position, float radius, Color32 color);
00111         virtual void drawSphereWires(Vector3f position, float radius, int rings, int slices,
00112             Color32 color);
00113
00114         virtual void drawCylinder(Vector3f position, float radiusTop, float radiusBottom,
00115             float height, int slices, Color32 color);
00116         virtual void drawCylinderWires(Vector3f position, float radiusTop, float radiusBottom,
00117             float height, int slices, Color32 color);
00118         virtual void drawCylinderEx(Vector3f startPos, Vector3f endPos, float startRadius,
00119             float endRadius, int sides, Color32 color);
00120
00121         virtual void drawPlane(Vector3f position, Vector2f size, Color32 color);
00122
00123         virtual void drawLine3D(Vector3f startPos, Vector3f endPos, Color32 color);
00124
00125         virtual void drawModelEx(const std::string& id, Vector3f position,
00126             Vector3f rotationAxis, float rotationAngle, Vector3f scale,
00127             Color32 tint = CWHITE);
00128
00129         virtual void drawText(const std::string& text, float x, float y, float fontSize,
00130             Color32 color);
00131
00132         virtual void drawTextEx(const std::string& text, float x, float y, float fontSize,
00133             float spacing, Color32 color);
00134
00135         virtual void drawCircle(float centerX, float centerY, float radius,
00136             Color32 color);
00137         virtual void drawCircleLines(float centerX, float centerY,
00138             float radius, Color32 color);
00139
00140         virtual void drawRectangleRec(FloatRect rec, Color32 color);
```

```
00141
00142         virtual bool loadTexture(const std::string& id, const std::string& filepath);
00143
00144         virtual bool loadFont(const std::string& id, const std::string& filepath);
00145
00146         virtual void drawTexture(const std::string& id, float x, float y,
00147             Color32 tint = CWHITE);
00148
00149         virtual void drawTextureScaled(const std::string& id, float x, float y, float width,
00150             float height, Color32 tint = CWHITE);
00151
00152         virtual Vector2f getTextureSize(const std::string& id) const;
00153
00154         virtual bool loadSkybox(const std::string& id, const std::string& filepath);
00155
00156         virtual void drawSkybox(const std::string& id);
00157
00158         virtual float getTime() const;
00159
00160         Raylib();
00161         ~Raylib() = default;
00162 };
00163
00164 #endif /* !RAYLIB_HPP_ */
```

7.38 RayLibEnc.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** RayLibEnc
00006 */
00007
00008 #ifndef RAYLIBENC_HPP_
00009 #define RAYLIBENC_HPP_
00010
00011 #include <string>
00012 #include <map>
00013 #include <memory>
00014 #include "raylib.h"
00015 #include "../../Utils/InputType.hpp"
00016
00017 class RayLibEnc {
00018     public:
00019         RayLibEnc();
00020         ~RayLibEnc();
00021
00022         // Window management methods
00023         void initWindow(int width, int height, const std::string &title);
00024         void closeWindow();
00025         bool windowShouldClose() const;
00026         void beginDrawing();
00027         void endDrawing();
00028         void clearBackground(Color color = WHITE);
00029         bool isWindowReady() const;
00030         int getMonitorWidth(int monitor) const;
00031         int getMonitorHeight(int monitor) const;
00032         void waitTime(float seconds) const;
00033         void setTargetFPS(int fps) const;
00034         int getFPS() const;
00035         float getFrameTime() const;
00036
00037         // Collision methods
00038         bool checkCollisionPointRec(Vector2 point, Rectangle rec) const;
00039
00040         // Ray and collision methods for 3D
00041         Ray getMouseRay(Vector2 mousePosition);
00042         RayCollision getRayCollisionBox(Ray ray, BoundingBox box);
00043         RayCollision getRayCollisionSphere(Ray ray, Vector3 center, float radius);
00044         bool checkCollisionBoxes(BoundingBox box1, BoundingBox box2);
00045
00046         // Utility methods for 3D collisions
00047         Ray getMouseRayFromCurrent();
00048         BoundingBox createBoundingBox(Vector3 center, Vector3 size);
00049         BoundingBox createBoundingBoxFromMinMax(Vector3 min, Vector3 max);
00050
00051         // Texture methods
00052         void drawTextureRec(Texture2D texture, Rectangle source, Vector2 position, Color tint);
00053         void unloadTexture(Texture2D texture);
00054         Texture2D loadTextureFromFile(const std::string& filepath);
00055         void drawTextureEx(Texture2D texture, Vector2 position, Color tint);
00056         void drawTextureScaled(Texture2D texture, float x, float y, float width, float height,
00057             Color tint);
00058
```

```
00059         // Texture map accessor methods
00060         bool hasTexture(const std::string& id) const;
00061         Texture2D getTexture(const std::string& id) const;
00062         void addTexture(const std::string& id, Texture2D texture);
00063 
00064         // Input methods
00065         bool isMouseButtonDown(int button) const;
00066         bool isMouseButtonPressed(int button) const;
00067         bool isMouseButtonReleased(int button) const;
00068         bool isKeyDown(int key) const;
00069         bool isKeyPressed(int key) const;
00070         bool isKeyReleased(int key) const;
00071         Vector2 getMouseDelta();
00072         Vector2 getMousePosition() const;
00073         void setMousePosition(int x, int y);
00074         void disableCursor();
00075         void enableCursor();
00076         int getScreenWidth() const;
00077         int getScreenHeight() const;
00078         float getMouseWheelMove() const;
00079 
00080         // Gamepad methods
00081         bool isGamepadAvailable(int gamepad) const;
00082         bool isGamepadButtonPressed(int gamepad, int button) const;
00083         bool isGamepadButtonDown(int gamepad, int button) const;
00084         bool isGamepadButtonReleased(int gamepad, int button) const;
00085         float getGamepadAxisMovement(int gamepad, int axis) const;
00086 
00087         // Input type tracking methods
00088         InputType getLastInputType() const;
00089         void updateLastInputType();
00090 
00091         // Scissor mode methods for clipping
00092         void beginScissorMode(int x, int y, int width, int height);
00093         void endScissorMode();
00094 
00095         // 3D Environment methods
00096         void begin3DMode();
00097         void end3DMode();
00098         float vector3Distance(Vector3 v1, Vector3 v2) const;
00099         Vector3 vector3Normalize(Vector3 v) const;
00100         Vector3 vector3Subtract(Vector3 v1, Vector3 v2) const;
00101         Vector3 vector3Add(Vector3 v1, Vector3 v2) const;
00102 
00103         // Camera methods
00104         void initCamera();
00105         void setCameraPosition(Vector3 position);
00106         void setCameraTarget(Vector3 target);
00107         void setCameraUp(Vector3 up);
00108         void setCameraFovy(float fovy);
00109         void setCameraProjection(int projection);
00110         void updateCamera(int mode = CAMERA_FREE);
00111         void updateCameraFreeMode(float camMovingSpeed, float camRotaSpeed);
00112         Camera3D getCamera() const;
00113 
00114         // 3D Drawing methods
00115         void drawGrid(int slices, float spacing);
00116         void drawCube(Vector3 position, float width, float height, float length, Color color);
00117         void drawCubeWires(Vector3 position, float width, float height, float length,
00118             Color color);
00119         void drawSphere(Vector3 position, float radius, Color color);
00120         void drawSphereWires(Vector3 position, float radius, int rings, int slices,
00121             Color color);
00122         void drawCylinder(Vector3 position, float radiusTop, float radiusBottom,
00123             float height, int slices, Color color);
00124         void drawCylinderWires(Vector3 position, float radiusTop, float radiusBottom,
00125             float height, int slices, Color color);
00126         void drawCylinderEx(Vector3 startPos, Vector3 endPos, float startRadius,
00127             float endRadius, int sides, Color color);
00128         void drawPlane(Vector3 position, Vector2 size, Color color);
00129         void drawLine3D(Vector3 startPos, Vector3 endPos, Color color);
00130 
00131         // 3D Model methods
00132         bool loadModel(const std::string& id, const std::string& filepath,
00133             Vector3 center = {0.0f, 0.0f, 0.0f});
00134         void drawModel(const std::string& id, Vector3 position, float scale,
00135             Color tint = WHITE);
00136         void drawModelEx(const std::string& id, Vector3 position, Vector3 rotationAxis,
00137                          float rotationAngle, Vector3 scale, Color tint = WHITE);
00138         void drawModelWires(const std::string& id, Vector3 position, float scale,
00139             Color tint = WHITE);
00140         void drawModelWiresEx(const std::string& id, Vector3 position, Vector3 rotationAxis,
00141                               float rotationAngle, Vector3 scale, Color tint = WHITE);
00142         void unloadModel(const std::string& id);
00143         void unloadAllModels();
00144         bool modelExists(const std::string& id) const;
00145 
```

```
00146         // Skybox methods
00147         bool loadSkybox(const std::string& id, const std::string& filepath);
00148         void drawSkybox(const std::string& id);
00149         Color getDayNightColor(float cycleTime);
00150         float getTime() const;
00151
00152         // 2D Drawing methods
00153         void drawRectangleRec(Rectangle rec, Color color);
00154         void drawText(const std::string& text, float x, float y, float fontSize, Color color);
00155         void drawTextEx(const std::string& text, float x, float y, float fontSize,
00156             float spacing, Color color);
00157         void drawCircle(float centerX, float centerY, float radius, Color color);
00158         void drawCircleLines(float centerX, float centerY, float radius, Color color);
00159         float measureText(const std::string& text, float fontSize) const;
00160         float measureTextEx(const std::string& text, float fontSize, float spacing) const;
00161
00162         // Font methods
00163         bool loadFont(const std::string& id, const std::string& filepath);
00164         void unloadFont(const std::string& id);
00165         bool hasFontLoaded(const std::string& id) const;
00166         Font getFont(const std::string& id) const;
00167         void unloadAllFonts();
00168
00169     private:
00170         bool _isInitialized;
00171         Camera3D _camera;
00172         Vector2 _previousMousePosition;
00173         bool _isCursorLocked;
00174         InputType _lastInputType;
00175
00176         static constexpr float FONT_SCALE_FACTOR = 4.0f;
00177         static constexpr float FONT_RENDER_SCALE = 0.25f;
00178         static constexpr float FONT_SPACING_RATIO = 0.1f;
00179
00180         float getScaledFontSize(float fontSize) const;
00181         float getFontSpacing(float scaledFontSize) const;
00182         float getScaledSpacing(float spacing) const;
00183
00184         struct ModelData {
00185             Model model;
00186             unsigned int animationCount;
00187             Vector3 center;
00188         };
00189
00190         std::map<std::string, ModelData> _models;
00191         std::map<std::string, Texture2D> _textures;
00192         std::map<std::string, Sound> _sounds;
00193         std::map<std::string, Music> _musics;
00194         std::map<std::string, Font> _fonts;
00195 };
00196
00197 #endif /* !RAYLIBEnc_HPP_ */
```

7.39 Constants.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** Constants
00006 */
00007
00008 #ifndef CONSTANTS_HPP_
00009 #define CONSTANTS_HPP_
00010
00011     inline const float PLAYER_SCALE = 0.005f;
00012     inline const float EGG_SCALE = 1.0f;
00013     inline const float FOOD_SCALE = 0.005f;
00014     inline const float FOOD_FLOAT_AMPLITUDE = 0.05f;
00015     inline const float FOOD_FLOAT_SPEED = 1.5f;
00016     inline const char *CUSTOM_FONT_PATH = "gui/assets/fonts/fall.ttf";
00017     inline const float ROCK_SCALE = 0.2f;
00018     inline const float LINEMATE_SCALE = 0.2f;    // soccerball
00019     inline const float DERAUMERE_SCALE = 0.15f;  // beachball
00020     inline const float SIBUR_SCALE = 0.15f;      // basketball
00021     inline const float MENDIANE_SCALE = 0.18f;   // bowlingball
00022     inline const float PHIRAS_SCALE = 0.1f;      // eightball
00023     inline const float THYSTAME_SCALE = 0.1f;    // tennisball
00024
00025 #include <string>
00026 #include <vector>
00027 #include "HelpText.hpp"
00028 #include "../IDisplay.hpp"
00029
00030 namespace zappy::constants {
```

```
00031
00032     inline const char *USAGE_STRING = "USAGE: ./zappy_gui -p port -h machine\n"
00033                                       "option\t\tdescription\n"
00034                                       "-p port\t\tport number\n"
00035                                       "-h machine\thostname of the server";
00036
00037     inline const int FAILURE_EXIT_CODE = 84;
00038     inline const int SUCCESS_EXIT_CODE = 0;
00039 };
00040
00041 namespace colors {
00042
00043     inline const char *T_BOLD = "\033[1m";
00044     inline const char *T_RED = "\033[1m\033[31m";
00045     inline const char *T_GREEN = "\033[1m\033[32m";
00046     inline const char *T_YELLOW = "\033[1m\033[33m";
00047     inline const char *T_BLUE = "\033[1m\033[34m";
00048     inline const char *T_MAGENTA = "\033[1m\033[35m";
00049     inline const char *T_CYAN = "\033[1m\033[36m";
00050     inline const char *T_WHITE = "\033[1m\033[37m";
00051     inline const char *RESET = "\033[0m";
00052
00053 };
00054
00055 namespace zappy::structs {
00056
00057     struct Config {
00058         int port;
00059         std::string hostname;
00060     };
00061
00062     struct Tile {
00063         int x;
00064         int y;
00065         int food;
00066         int linemate;
00067         int deraumere;
00068         int sibur;
00069         int mendiane;
00070         int phiras;
00071         int thystame;
00072
00073         Tile(int _x = 0, int _y = 0, int _food = 0, int _linemate = 0,
00074              int _deraumere = 0, int _sibur = 0, int _mendiane = 0,
00075              int _phiras = 0, int _thystame = 0)
00076             : x(_x), y(_y), food(_food), linemate(_linemate),
00077               deraumere(_deraumere), sibur(_sibur),
00078               mendiane(_mendiane), phiras(_phiras), thystame(_thystame) {}
00079     };
00080
00081     struct Inventory {
00082         int food;
00083         int linemate;
00084         int deraumere;
00085         int sibur;
00086         int mendiane;
00087         int phiras;
00088         int thystame;
00089
00090         Inventory(int _food = 0, int _linemate = 0, int _deraumere = 0,
00091                   int _sibur = 0, int _mendiane = 0, int _phiras = 0,
00092                   int _thystame = 0)
00093             : food(_food), linemate(_linemate), deraumere(_deraumere),
00094               sibur(_sibur), mendiane(_mendiane), phiras(_phiras),
00095               thystame(_thystame) {}
00096     };
00097     struct Player {
00098         int number;
00099         int x;
00100         int y;
00101         int orientation;
00102         int level;
00103         std::string teamName;
00104         struct Inventory inventory;
00105
00106         Player(int _number = 0, int _x = 0, int _y = 0, int _orientation = 0,
00107                int _level = 1, const std::string &_teamName = "",
00108                struct Inventory _inventory = Inventory())
00109             : number(_number), x(_x), y(_y), orientation(_orientation),
00110               level(_level), teamName(_teamName), inventory(_inventory) {}
00111     };
00112
00113     struct Incantation {
00114         int x;
00115         int y;
00116         int level;
00117         std::vector<int> players;
```

```
00118
00119         Incantation(int _x = 0, int _y = 0, int _level = 1,
00120                     const std::vector<int> &_players = {})
00121             : x(_x), y(_y), level(_level), players(_players) {}
00122     };
00123
00124     struct Egg {
00125         int eggNumber;
00126         int playerNumber;
00127         int x;
00128         int y;
00129         bool hatched;
00130         std::string teamName;
00131
00132         Egg(int _eggNumber = 0, int _playerNumber = 0, int _x = 0, int _y = 0,
00133             bool _hatched = false, const std::string &_teamName = "")
00134             : eggNumber(_eggNumber), playerNumber(_playerNumber), x(_x), y(_y),
00135               hatched(_hatched), teamName(_teamName) {}
00136     };
00137 };
00138
00139 namespace zappy::gui {
00140
00141     inline const char *WINDOW_TITLE = "Zappy GUI";
00142     inline const unsigned int FPS = 60;
00143     inline const char *CUSTOM_FONT_PATH = "gui/assets/fonts/fall.ttf";
00144
00145     inline const char *SPLASH_TITLE = "ZAPPY";
00146     inline const char *SPLASH_SUBTITLE = "Advanced 3D Game Visualizer";
00147
00148     inline const float CAMERA_SENSITIVITY = 0.001f;
00149     inline const float GAMEPAD_STICK_SENSITIVITY = 3.0f;
00150     inline const float GAMEPAD_DEADZONE = 0.2f;
00151     inline const float POSITION_MULTIPLIER = 2.2f;
00152
00153     inline const float FOG_DISTANCE_MAX = 60.0f;
00154     inline const float DURATION_DAYNIGHT_CYCLE = 120.0f;
00155
00156     inline const float EGG_SCALE = 1.0f;
00157     inline const float FOOD_SCALE = 0.005f;
00158     inline const float FOOD_FLOAT_AMPLITUDE = 0.05f;
00159     inline const float FOOD_FLOAT_SPEED = 1.0f;
00160
00161     inline const float LINEMATE_SCALE = 0.2f;    // soccerball
00162     inline const float DERAUMERE_SCALE = 0.15f;  // beachball
00163     inline const float SIBUR_SCALE = 0.15f;      // basketball
00164     inline const float MENDIANE_SCALE = 0.18f;   // bowlingball
00165     inline const float PHIRAS_SCALE = 0.1f;      // eightball
00166     inline const float THYSTAME_SCALE = 0.1f;    // tennisball
00167
00168     inline const float PLAYER_ROTATION_SPEED = 720.0f;
00169     inline const float ROTATION_INTERPOLATION_THRESHOLD = 1.0f;
00170
00171     inline const float PLAYER_MOVEMENT_SPEED = 8.0f;
00172     inline const float MOVEMENT_INTERPOLATION_THRESHOLD = 0.05f;
00173
00174     enum class CameraMode {
00175         FREE = 0,
00176         TARGETED = 1,
00177         PLAYER = 2,
00178         NB_MODES = 3,
00179     };
00180
00181
00182     struct PlayerModelInfo {
00183         std::string name;
00184         std::string modelPath;
00185         Vector3f center;
00186         Vector3f scale;
00187         float rotation;
00188     };
00189
00190     inline const std::vector<PlayerModelInfo> PLAYER_MODELS_INFO = {
00191         {"playerLvl1", "gui/assets/models/playerLvl1.glb",
00192             {0.0f, -0.0f, 0.0f}, {0.005f, 0.005f, 0.005f}, 0.0f},
00193         {"playerLvl2", "gui/assets/models/playerLvl2.glb",
00194             {0.0f, -0.5f, 0.0f}, {0.25f, 0.25f, 0.25f}, 0.0f},
00195         {"playerLvl3", "gui/assets/models/playerLvl3.glb",
00196             {0.0f, 20.0f, 0.0f}, {0.0045f, 0.0045f, 0.0045f}, 0.0f},
00197         {"playerLvl4", "gui/assets/models/playerLvl4.glb",
00198             {0.0f, 0.0025f, 0.0f}, {40.0f, 40.0f, 40.0f}, -90.0f},
00199         {"playerLvl5", "gui/assets/models/playerLvl5.glb",
00200             {8.0f, -1.8f, 0.0f}, {0.2f, 0.2f, 0.2f}, 0.0f},
00201         {"playerLvl6", "gui/assets/models/playerLvl6.glb",
00202             {0.0f, 20.0f, 0.0f}, {0.009f, 0.009f, 0.009f}, 0.0f},
00203         {"playerLvl7", "gui/assets/models/playerLvl7.glb",
00204             {0.0f, 0.4f, 0.0f}, {0.25f, 0.25f, 0.25f}, 0.0f},
```

```
00205         {"playerLvl8", "gui/assets/models/playerLvl8.glb",
00206             {0.0f, 1.0f, 0.0f}, {0.085, 0.085f, 0.085f}, 0.0f}
00207     };
00208 }
00209
00210 #endif /* !CONSTANTS_HPP_ */
```

7.40 GamepadConstants.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** GamepadConstants
00006 */
00007
00008 #ifndef GAMEPAD_CONSTANTS_HPP_
00009 #define GAMEPAD_CONSTANTS_HPP_
00010
00011 #ifndef GAMEPAD_AXIS_LEFT_X
00012     #define GAMEPAD_AXIS_LEFT_X       0
00013     #define GAMEPAD_AXIS_LEFT_Y       1
00014     #define GAMEPAD_AXIS_RIGHT_X      2
00015     #define GAMEPAD_AXIS_RIGHT_Y      3
00016 #endif
00017
00018 #ifndef GAMEPAD_BUTTON_A
00019     #define GAMEPAD_AXIS_LEFT_TRIGGER 4
00020     #define GAMEPAD_AXIS_RIGHT_TRIGGER 5
00021     #define GAMEPAD_BUTTON_A          6
00022     #define GAMEPAD_BUTTON_B          5
00023     #define GAMEPAD_BUTTON_X          9
00024     #define GAMEPAD_BUTTON_Y          8
00025     #define GAMEPAD_BUTTON_START      17
00026     #define GAMEPAD_BUTTON_SELECT     16
00027     #define GAMEPAD_BUTTON_UP         1
00028     #define GAMEPAD_BUTTON_RIGHT      2
00029     #define GAMEPAD_BUTTON_DOWN       3
00030     #define GAMEPAD_BUTTON_LEFT       4
00031     #define GAMEPAD_BUTTON_LEFT_SHOULDER  10
00032     #define GAMEPAD_BUTTON_RIGHT_SHOULDER 12
00033     #define GAMEPAD_BUTTON_LEFT_TRIGGER   13
00034     #define GAMEPAD_BUTTON_RIGHT_TRIGGER  15
00035 #endif
00036
00037 #endif /* !GAMEPAD_CONSTANTS_HPP_ */
```

7.41 HelpText.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** HelpText
00006 */
00007
00008 #ifndef HELP_TEXT_HPP_
00009 #define HELP_TEXT_HPP_
00010
00011 namespace zappy::constants {
00012
00013     inline const char *HELP_TITLE =
00014         "HELP";
00015
00016     inline const char *HELP_SECTION_1 =
00017         "Game Overview";
00018
00019     inline const char *HELP_SECTION_1_CONTENT =
00020         "Zappy is a game where AI-controlled players compete to collect resources\n"
00021         "and level up on a dynamically changing map. The GUI allows you to visualize\n"
00022         "the game state, players, and resources in real-time.";
00023
00024     inline const char *HELP_SECTION_2 =
00025         "Controls";
00026
00027     inline const char *HELP_SECTION_2_CONTENT =
00028         "Camera Movement:\n"
00029         "  - Arrow keys or ZQSD: Move camera\n"
00030         "  - Controller: Use left stick to move camera\n"
00031         "  - Right mouse button + drag: Rotate camera\n\n"
00032         "Interface:\n"
00033         "  - Click on players to see their stats\n"
```

```
00034         "  - Click on tiles to see their stats\n"
00035         "  - Use the RESET CAMERA button to return to default view\n"
00036         "  - Use the Settings button to adjust game settings";
00037
00038     inline const char *HELP_SECTION_3 =
00039         "Teams and Players";
00040
00041     inline const char *HELP_SECTION_3_CONTENT =
00042         "The left panel shows all teams and their player IDs.\n"
00043         "Players have different levels based on collected resources.\n"
00044         "The team that first gets a player to level 8 wins the game.";
00045
00046     inline const char *HELP_SECTION_4 =
00047         "Resources";
00048
00049     inline const char *HELP_SECTION_4_CONTENT =
00050         "Resources on the map are represented by different colored objects.\n"
00051         "Players collect these resources to perform rituals and level up.";
00052
00053     inline const char *HELP_SECTION_5 =
00054         "Levels";
00055
00056     inline const char *HELP_SECTION_6 =
00057         "Items";
00058
00059 }  // namespace zappy::constants
00060
00061 #endif /* !HELP_TEXT_HPP_ */
```

7.42 InputType.hpp

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** InputType
00006 */
00007
00008 #ifndef INPUTTYPE_HPP_
00009 #define INPUTTYPE_HPP_
00010
00011 enum class InputType {
00012     KEYBOARD_MOUSE,
00013     GAMEPAD,
00014     NONE
00015 };
00016
00017 #endif /* !INPUTTYPE_HPP_ */
```

7.43 algo.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** algo
00006 */
00007
00008 #ifndef ALGO_H_
00009     #define ALGO_H_
00010
00011 typedef struct tiles_s {
00012     int x;
00013     int y;
00014 } tiles_t;
00015
00016 /* Algo.c */
00017 tiles_t *shuffle_fisher(int width, int heigth);
00018
00019 #endif /* !ALGO_H_ */
```

7.44 game.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** game
00006 */
```

```
00007
00008 #include "network.h"
00009 #include <time.h>
00010 #include <pthread.h>
00011 #include <sys/time.h>
00012
00013 #ifndef GAME_H_
00014     #define GAME_H_
00015
00016 typedef struct action_request_s action_request_t;
00017 typedef struct action_queue_s action_queue_t;
00018 typedef struct player_s player_t;
00019
00020 /* Definition of the directions */
00021 typedef enum direction_e {
00022     NORTH = 1,
00023     EAST = 2,
00024     SOUTH = 3,
00025     WEST = 4
00026 } direction_t;
00027
00028 /* definintion od the different element on the map */
00029 typedef enum crystal_e {
00030     FOOD,
00031     LINEMATE,
00032     DERAUMERE,
00033     SIBUR,
00034     MENDIANE,
00035     PHIRAS,
00036     THYSTAME
00037 } crystal_t;
00038
00039
00040 /* This enum defines the priority of the action in the queue */
00041 typedef enum action_priority_e {
00042     PRIORITY_CRITICAL = 0,
00043     PRIORITY_HIGH = 1,
00044     PRIORITY_MEDIUM = 2,
00045     PRIORITY_LOW = 3
00046 } action_priority_t;
00047
00048 /* This strucuture allows use to define a 'queue' of the requests */
00049 typedef struct action_queue_s {
00050     action_request_t *head;
00051     action_request_t *tail;
00052     int count;
00053 } action_queue_t;
00054
00055
00056 typedef struct egg_s {
00057     int id; /* Id of the egg */
00058     int posX;
00059     int posY;
00060     char *teamName;  /* Name of the team that laid it */
00061     int idLayer;  /* Id of the player that layed it */
00062     bool isHatched;
00063     struct egg_s *next;
00064 } egg_t;
00065
00066
00067 /* Struct defining the inventory of tiles and players */
00068 typedef struct inventory_s {
00069     int nbFood;
00070     int nbLinemate;
00071     int nbDeraumere;
00072     int nbSibur;
00073     int nbMendiane;
00074     int nbPhiras;
00075     int nbThystame;
00076 } inventory_t;
00077
00078 /* Definition of the incantation structure */
00079 typedef struct incantation_s {
00080     int levelt_to_reach;
00081     int nb_players;
00082     inventory_t required_inventory;
00083 } incantation_t;
00084
00085
00086 /* Player struct */
00087 typedef struct player_s {
00088     int id;
00089     network_t *network;
00090     int level;
00091     int posX;
00092     int posY;
00093     direction_t direction;
```

```
00094     inventory_t *inventory;
00095     char *team;
00096     /* New aditions for the smart pollin */
00097     action_queue_t *pending_actions;
00098     struct timeval last_action_time;
00099     bool is_busy;
00100     time_t remaining_cooldown;
00101     float time_action;
00102     char *current_action;
00103     /* Food timer for health system */
00104     int food_timer;  /* Time units until next food consumption */
00105     time_t last_food_check;  /* Last time food was checked */
00106
00107     struct player_s *next;
00108 } player_t;
00109
00110 /* This structure define the request strut */
00111 typedef struct action_request_s {
00112     char *command;
00113     time_t timestamp;
00114     float time_limit;  // in game ticks (7/f, 42/f, etc.)
00115     action_priority_t priority;
00116     player_t *player;
00117     struct action_request_s *next;
00118 } action_request_t;
00119
00120 /* Team Strcut */
00121 typedef struct team_s {
00122     char *name;
00123     int nbPlayers;
00124     int nbPlayerAlive;
00125     player_t *players;
00126     struct team_s *next;
00127 } team_t;
00128
00129
00130 /* Structure that holds the size and array of tiles */
00131 typedef struct map_t {
00132     int width;
00133     int height;
00134     egg_t *currentEggs;  /* List of current eggs */
00135     inventory_t **tiles;  /* Here we call inv for the tile*/
00136 } map_t;
00137
00138
00139 /* Map struct */
00140 typedef struct game_s {
00141     team_t *teams;
00142     map_t *map;
00143     bool won;
00144 } game_t;
00145
00146 #endif /* !GAME_H_ */
```

7.45 my.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** my
00006 */
00007
00008 #ifndef MY_H_
00009     #define MY_H_
00010
00011 int int_str_len(int value);
00012 char *my_itoa(unsigned int nb);
00013 int is_only_digits(const char *str);
00014 int my_unsignedlen(unsigned int nb);
00015
00016 #endif /* !MY_H_ */
```

7.46 my.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** my
00006 */
00007
```

```
00008 #ifndef MY_H_
00009     #define MY_H_
00010
00011 int int_str_len(int value);
00012 char *my_itoa(unsigned int nb);
00013 int is_only_digits(const char *str);
00014 int my_unsignedlen(unsigned int nb);
00015
00016 #endif /* !MY_H_ */
```

7.47 zappy.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** Zappy
00004 ** File description:
00005 ** Server :: Zappy header
00006 */
00007
00008 #include <stdbool.h>
00009 #include <poll.h>
00010 #include "game.h"
00011 #include "my.h"
00012
00013 #ifndef ZAPPY_H_
00014     #define ZAPPY_H_
00015
00016 /* items handler */
00017 typedef struct {
00018     char *name;
00019     void (*add_func)(inventory_t *);
00020 } item_handler_t;
00021
00022
00023 /* Cli parameter of the server */
00024 typedef struct params_s {
00025     int port;
00026     int x;
00027     int y;
00028     int nb_team;
00029     char **teams;
00030     int nb_client;
00031     int freq;
00032     bool is_debug;
00033 } params_t;
00034
00035 /* Structure to handle the network side of the gui*/
00036 typedef struct graph_net_s {
00037     network_t *network;
00038     bool mapSent;
00039     struct graph_net_s *next;
00040 } graph_net_t;
00041
00042 /* Unified polling structure for all clients */
00043 typedef struct unified_poll_s {
00044     struct pollfd *fds;
00045     int count;
00046     int capacity;
00047 } unified_poll_t;
00048
00049 typedef struct zappy_s {
00050     server_t *network;
00051     game_t *game;
00052     graph_net_t *graph;
00053     params_t *params;
00054     unified_poll_t *unified_poll;
00055 } zappy_t;
00056
00057 typedef struct command_pf_s {
00058     char const *flag;
00059     bool (*checker)(const char *, const char *, params_t *);
00060 } command_pf_t;
00061
00062 typedef struct {
00063     char *command;
00064     float base_time;
00065     action_priority_t priority;
00066     int (*handler)(player_t *, char *, zappy_t *);
00067 } command_info_t;
00068
00069 typedef struct graphic_pf_s {
00070     char *command;
00071     int (*handler)(zappy_t *zappy, graph_net_t *graphic, char *message);
00072 } graphic_pf_t;
00073
```

```
00074 /* messages.c */
00075 int helper(void);
00076 void error_message(const char *message);
00077 void valid_message(char const *message);
00078 int return_error(char const *message);
00079 void other_message(char const *message);
00080
00081 /* checkers.c */
00082 bool check_port(char const *flag, char const *value, params_t *params);
00083 bool check_width(char const *flag, char const *value, params_t *params);
00084 bool check_height(char const *flag, char const *value, params_t *params);
00085 bool check_client(char const *flag, char const *value, params_t *params);
00086 bool check_freq(char const *flag, char const *value, params_t *params);
00087
00088 /* unified_poll.c */
00089 unified_poll_t *init_unified_poll(void);
00090 void free_unified_poll(unified_poll_t *poll_struct);
00091 int add_fd_to_poll(unified_poll_t *poll_struct, int fd, short events);
00092 int remove_fd_from_poll(unified_poll_t *poll_struct, int fd);
00093 void rebuild_poll_fds(zappy_t *zappy);
00094 void poll_all_clients(zappy_t *zappy);
00095 void free_action_queue_pl(action_queue_t *queue);
00096
00097 /* build_fds.c */
00098 void rebuild_poll_fds(zappy_t *zappy);
00099
00100
00101 /* signal.c */
00102 void setup_signal(void);
00103 int *get_running_state(void);
00104
00105 /* params.c */
00106 params_t *check_args(int argc, char **argv);
00107 void *free_params(params_t *params);
00108
00109 /* params_cherckers.c */
00110 bool validate_no_extra_args(int argc, char **argv);
00111
00112 /* server.c */
00113 zappy_t *init_server(int argc, char **argv);
00114 void *free_zappy(zappy_t *server);
00115
00116 /* protocol.c */
00117 int start_protocol(zappy_t *server);
00118
00119 /* client.c */
00120 bool process_new_client(const char *team_name, int fd, zappy_t *server);
00121 team_t *add_client_to_team(const char *team_name, int fd, zappy_t *server);
00122 void check_player_status(zappy_t *zappy);
00123 void remove_player_by_fd(zappy_t *zappy, int fd);
00124
00125 /* init_map.c */
00126 int init_game(zappy_t *server);
00127 int distribute_resources(zappy_t *z);
00128 map_t *create_map(int width, int height);
00129
00130 /* init_team.c */
00131 int init_teams(zappy_t *server);
00132
00133 /* accept.c */
00134 int accept_client(zappy_t *server);
00135
00136 /* refill_food.c */
00137 void count_current_resources(zappy_t *z, int current_count[7]);
00138 void refill_food(zappy_t *zappy);
00139
00140 /* free server  */
00141 void *free_zappy(zappy_t *server);
00142 void *free_params(params_t *params);
00143 void *free_player(player_t *player);
00144 void free_map(map_t *map);
00145
00146 /* free_server.c */
00147 void free_networkplayer(player_t *player);
00148 void free_players(player_t *player);
00149 void free_teams(team_t *teams);
00150
00151
00152 /* Function to send info to the gui */
00153 int send_map_size(zappy_t *server);
00154 int send_entrie_map(zappy_t *server);
00155 int send_map_tile(inventory_t **tiles, zappy_t *server,
00156     int posX, int posY);
00157 int send_team_name(zappy_t *server);
00158 int send_egg(zappy_t *zappy, egg_t *egg);
00159 int send_entire_egg_list(zappy_t *zappy);
00160 int send_time_message(zappy_t *zappy);
```

```
00161 int send_egg_death(zappy_t *zappy, egg_t *egg);
00162 int send_egg_connect(zappy_t *zappy, egg_t *currentEgg);
00163 int send_player_connect(zappy_t *zappy, player_t *player);
00164 int send_player_pos(zappy_t *zappy, player_t *player);
00165 int send_player_level(zappy_t *zappy, player_t *player);
00166 int send_player_connect_to_specific_gui(graph_net_t *fd, player_t *p);
00167 int send_player_inventory(zappy_t *zappy, player_t *player);
00168 int send_player_expelled(zappy_t *zappy, player_t *player);
00169 int send_broadcast_to_all(zappy_t *zappy, const char *message);
00170 int send_broadcast_to_player(zappy_t *zappy, player_t *player,
00171     const char *message);
00172 int send_player_laying_egg(zappy_t *zappy, player_t *player);
00173 int send_ressource_droped(zappy_t *zappy, player_t *player,
00174     int ressourceType);
00175 int send_ressource_collected(zappy_t *zappy, player_t *player,
00176     int ressourceType);
00177 int send_player_death(zappy_t *zappy, player_t *player);
00178 int send_updated_time(zappy_t *zappy, int time);
00179 int send_end_game(zappy_t *zappy, const char *teamName);
00180 int send_str_message(zappy_t *zappy, const char *message);
00181 int send_unknown_command(zappy_t *zappy);
00182 int send_command_parameter(zappy_t *zappy);
00183 int send_start_incantation(zappy_t *zappy, player_t *player, int *player_list,
00184     int nb_player);
00185 int send_end_incantation(zappy_t *zappy, player_t *player, char *result);
00186
00187 /* init_egg.c */
00188 int init_egg(zappy_t *zappy);
00189 egg_t *add_egg_node(int id, int *pos, char *team_name, int id_layer);
00190 egg_t *kil_egg_node(egg_t **head, int egg_id);
00191
00192 /* AI messages */
00193 int forward_message(player_t *player, params_t *params);
00194
00195 /* Pollin handler */
00196 void process_player_actions(player_t *player, zappy_t *zappy);
00197 void process_player_actions_tick(zappy_t *zappy);
00198 void execute_action(player_t *player, action_request_t *action,
00199     zappy_t *zappy);
00200 void queue_action(player_t *player, char *command, zappy_t *zappy);
00201 action_queue_t *init_action_queue(void);
00202 void free_action_queue(action_queue_t *queue);
00203 action_request_t *create_action_request(char *command, player_t *player,
00204     int frequency);
00205 const command_info_t *find_command_info(char *command);
00206 action_request_t *dequeue_highest_priority_action(action_queue_t *queue);
00207 void free_action_request(action_request_t *action);
00208 void insert_action_by_priority(action_queue_t *queue,
00209     action_request_t *action);
00210
00211 /* Unified polling functions */
00212 unified_poll_t *init_unified_poll(void);
00213 void free_unified_poll(unified_poll_t *poll_struct);
00214 int add_fd_to_poll(unified_poll_t *poll_struct, int fd, short events);
00215 int remove_fd_from_poll(unified_poll_t *poll_struct, int fd);
00216 void poll_all_clients(zappy_t *zappy);
00217 void rebuild_poll_fds(zappy_t *zappy);
00218
00219 /* This is the definition of the array function of the commands */
00220 int handle_forward(player_t *player, char *command, zappy_t *zappy);
00221
00222 int handle_left(player_t *player, char *command, zappy_t *zappy);
00223 int left_message(player_t *player);
00224 int print_left_server(player_t *player);
00225
00226 int handle_right(player_t *player, char *command, zappy_t *zappy);
00227 int print_right_server(player_t *player);
00228 int right_message(player_t *player);
00229
00230 int handle_connect_nbr(player_t *player, char *command, zappy_t *zappy);
00231 int handle_eject(player_t *player, char *command, zappy_t *zappy);
00232
00233 /* fork */
00234 int handle_fork(player_t *player, char *command, zappy_t *zappy);
00235 int handle_fork_end(player_t *player, zappy_t *zappy);
00236
00237 int print_look_server(player_t *player);
00238
00239 /* Incantation handler */
00240 int handle_incantation(player_t *player, char *command, zappy_t *zappy);
00241 int check_player_on_tile(player_t *player, zappy_t *zappy);
00242 void increase_level_player(int *player_list, int nb_players, zappy_t *zappy);
00243 int *get_player_on_tile_id(int posX, int posY, zappy_t *zappy, int nb_players);
00244 int handle_end_incantation(player_t *player, zappy_t *zappy);
00245 int get_nb_player_on_tile(int posX, int posY, zappy_t *zappy, int level);
00246 void mark_players_incanting(int *player_list, int nb_players, zappy_t *zappy);
00247 void remove_crystal_from_tiles(int posX, int posY, int level, zappy_t *zappy);
```

```
00248 int validate_and_get_players(player_t *player, zappy_t *zappy,
00249     int **player_list);
00250
00251
00252 int handle_inventory(player_t *player, char *command, zappy_t *zappy);
00253 int inventory_message(player_t *player);
00254 int print_inventory_server(player_t *player, int len);
00255
00256 int handle_broadcast(player_t *player, char *command, zappy_t *zappy);
00257 int broadcast_text(player_t *source, player_t *dest, char *text,
00258     zappy_t *zappy);
00259
00260 int handle_look(player_t *player, char *command, zappy_t *zappy);
00261 int handle_set(player_t *player, char *command, zappy_t *zappy);
00262 int handle_take(player_t *player, char *command, zappy_t *zappy);
00263
00264 /* graphic_clinet.c */
00265 graph_net_t *add_graph_node(graph_net_t **head, int fd);
00266 graph_net_t *remove_graph_node(graph_net_t **head, int fd);
00267 int poll_graphic_commands(zappy_t *zappy, graph_net_t *current,
00268     char *buffer);
00269
00270
00271 /* Element hander.c */
00272 void add_food(inventory_t *inventory);
00273 void add_linemate(inventory_t *inventory);
00274 void add_deraumere(inventory_t *inventory);
00275 void add_sibur(inventory_t *inventory);
00276 void add_mendiane(inventory_t *inventory);
00277 void add_phiras(inventory_t *inventory);
00278 void add_thystame(inventory_t *inventory);
00279
00280 void rm_food(inventory_t *inventory);
00281 void rm_linemate(inventory_t *inventory);
00282 void rm_deraumere(inventory_t *inventory);
00283 void rm_sibur(inventory_t *inventory);
00284 void rm_mendiane(inventory_t *inventory);
00285 void rm_phiras(inventory_t *inventory);
00286 void rm_thystame(inventory_t *inventory);
00287
00288 /* Element handler.c */
00289 int msz(zappy_t *zappy, graph_net_t *graphic, char *message);
00290 int bct(zappy_t *zappy, graph_net_t *graphic, char *message);
00291 int mct(zappy_t *zappy, graph_net_t *graphic, char *message);
00292 int tna(zappy_t *zappy, graph_net_t *graphic, char *message);
00293 int ppo(zappy_t *zappy, graph_net_t *graphic, char *message);
00294 int plv(zappy_t *zappy, graph_net_t *graphic, char *message);
00295 int plu(zappy_t *zappy, graph_net_t *graphic, char *message);
00296 int pld(zappy_t *zappy, graph_net_t *graphic, char *message);
00297 int pin(zappy_t *zappy, graph_net_t *graphic, char *message);
00298 int sgt(zappy_t *zappy, graph_net_t *graphic, char *message);
00299 int sst(zappy_t *zappy, graph_net_t *graphic, char *message);
00300 int kil(zappy_t *zappy, graph_net_t *graphic, char *message);
00301 int tar(zappy_t *zappy, graph_net_t *graphic, char *message);
00302 int tsr(zappy_t *zappy, graph_net_t *graphic, char *message);
00303 int pia(zappy_t *zappy, graph_net_t *graphic, char *message);
00304 int pis(zappy_t *zappy, graph_net_t *graphic, char *message);
00305 int send_bct_message(graph_net_t *graphic, int x, int y,
00306     inventory_t *inventory);
00307 int send_pin_message(graph_net_t *graphic, player_t *player);
00308
00309 /* player_id.c */
00310 player_t *get_player_by_id(game_t *game, int player_id);
00311 int get_next_free_id(zappy_t *server);
00312 void verify_player_id(zappy_t *zappy, player_t *player);
00313
00314 /* pending_connections.c */
00315 bool is_pending_connection(zappy_t *zappy, int fd);
00316 int accept_client_team_name(zappy_t *zappy, int new_sockfd);
00317 #endif /* !ZAPPY_H_ */
```

7.48 buffer.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** buffer
00006 */
00007
00008 #include <stddef.h>
00009
00010 #ifndef BUFFER_H_
00011     #define BUFFER_H_
00012
```

```
00013     #define BUFFER_SIZE 1024
00014
00015
00016 typedef struct buffer_s {
00017     char data[BUFFER_SIZE];
00018     int head;
00019     int tail;
00020     int full;
00021 } buffer_t;
00022
00023 /* buffer.c */
00024 int advance(int idx);
00025 void cb_write(buffer_t *cb, char c);
00026 int cb_getline(buffer_t *cb, char *line, int max_len);
00027 buffer_t *create_buffer(void);
00028 int write_in_buffer(buffer_t *cb, const char *str);
00029 void print_buffer_state(buffer_t *cb, const char *label);
00030
00031 #endif /* !BUFFER_H_ */
```

7.49 buffer.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** buffer
00006 */
00007
00008 #include <stddef.h>
00009
00010 #ifndef BUFFER_H_
00011     #define BUFFER_H_
00012
00013     #define BUFFER_SIZE 1024
00014
00015
00016 typedef struct buffer_s {
00017     char data[BUFFER_SIZE];
00018     int head;
00019     int tail;
00020     int full;
00021 } buffer_t;
00022
00023 /* buffer.c */
00024 int advance(int idx);
00025 void cb_write(buffer_t *cb, char c);
00026 int cb_getline(buffer_t *cb, char *line, int max_len);
00027 buffer_t *create_buffer(void);
00028 int write_in_buffer(buffer_t *cb, const char *str);
00029 void print_buffer_state(buffer_t *cb, const char *label);
00030
00031 #endif /* !BUFFER_H_ */
```

7.50 network.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** network
00006 */
00007
00008 #include "buffer.h"
00009
00010 #include <poll.h>
00011
00012 #ifndef NETWORK_H_
00013     #define NETWORK_H_
00014
00015
00016 /* Write an errro message */
00017 void error_print(char const *message);
00018 /* Set the socket of the file descriptor */
00019 int set_socket(void);
00020 /* Write for basic fd without struct */
00021 int write_fd(int fd, const char *message);
00022 /* Get message from the fd */
00023 char *get_fd_message(int fd);
00024
00025 /* Server part of the network */
00026 typedef struct server_s {
```

```
00027     int sockfd;
00028     int port;
00029     int backlog;
00030     struct pollfd pollserver;
00031 } server_t;
00032
00033
00034 /* Bind the file decriptor to the port */
00035 int bind_socket(server_t *server);
00036 /* Specify the queue the fd will use */
00037 int listen_socket(server_t *server);
00038 /* Close the server */
00039 void close_server(server_t *server);
00040
00041
00042 /* Struct that "handles" the network element */
00043 typedef struct network_s {
00044     int fd;
00045     buffer_t *readingBuffer;
00046     buffer_t *writingBuffer;
00047 } network_t;
00048
00049 /* Accept new connetion */
00050 int accept_connection(server_t *server);
00051 /* Handle Message input */
00052 char *get_message(network_t *network);
00053 /* Hello */
00054 int write_message(network_t *network);
00055 /* Close fd client */
00056 void close_client(network_t *network);
00057
00058 #endif /* !NETWORK_H_ */
```

7.51 network.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** network
00006 */
00007
00008 #include "buffer.h"
00009
00010 #include <poll.h>
00011
00012 #ifndef NETWORK_H_
00013     #define NETWORK_H_
00014
00015
00016 /* Write an errro message */
00017 void error_print(char const *message);
00018 /* Set the socket of the file descriptor */
00019 int set_socket(void);
00020 /* Write for basic fd without struct */
00021 int write_fd(int fd, const char *message);
00022 /* Get message from the fd */
00023 char *get_fd_message(int fd);
00024
00025 /* Server part of the network */
00026 typedef struct server_s {
00027     int sockfd;
00028     int port;
00029     int backlog;
00030     struct pollfd pollserver;
00031 } server_t;
00032
00033
00034 /* Bind the file decriptor to the port */
00035 int bind_socket(server_t *server);
00036 /* Specify the queue the fd will use */
00037 int listen_socket(server_t *server);
00038 /* Close the server */
00039 void close_server(server_t *server);
00040
00041
00042 /* Struct that "handles" the network element */
00043 typedef struct network_s {
00044     int fd;
00045     buffer_t *readingBuffer;
00046     buffer_t *writingBuffer;
00047 } network_t;
00048
00049 /* Accept new connetion */
00050 int accept_connection(server_t *server);
```

```
00051 /* Handle Message input */
00052 char *get_message(network_t *network);
00053 /* Hello */
00054 int write_message(network_t *network);
00055 /* Close fd client */
00056 void close_client(network_t *network);
00057
00058 #endif /* !NETWORK_H_ */
```

7.52 fake_malloc.h

```
00001 /*
00002 ** EPITECH PROJECT, 2025
00003 ** B-YEP-400-NAN-4-1-zappy-albane.merian
00004 ** File description:
00005 ** fake_malloc
00006 */
00007
00008 #ifndef FAKE_MALLOC_H_
00009     #define FAKE_MALLOC_H_
00010
00011
00012 void enable_malloc_failure(int after_calls);
00013 void disable_malloc_failure(void);
00014 void reset_malloc_counter(void);
00015 void *malloc(size_t size);
00016 void *calloc(size_t nmemb, size_t size);
00017
00018 #endif /* !FAKE_MALLOC_H_ */
```