Headsoccer

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Chapter 1

Head_soccer_game

Game of skill that uses OpenGL API (GLFW library)

Useful links: https://learnopengl.com

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

Chapter 3

Class Index

3.1 Class List

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

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

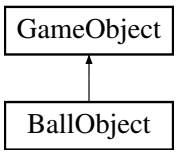
Chapter 5

Class Documentation

5.1 BallObject Class Reference

`#include <game_object.h>`

Inheritance diagram for BallObject:



Public Member Functions

- BallObject ()
- BallObject (glm::vec2 pos, float radius, glm::vec2 velocity, Texture2D sprite)
- glm::vec2 Move (float dt, unsigned int window_width, unsigned int window_height)
- void Reset (glm::vec2 position, glm::vec2 velocity)

Public Attributes

- float Radius
- bool Stuck

5.1.1 Constructor & Destructor Documentation

5.1.1.1 BallObject() [1/2]

`BallObject::BallObject ( )`

5.1.1.2 BallObject() [2/2]

```
BallObject::BallObject (
            glm::vec2 pos,
            float radius,
            glm::vec2 velocity,
            Texture2D sprite )
```

5.1.2 Member Function Documentation

5.1.2.1 Move()

```
glm::vec2 BallObject::Move (
            float dt,
            unsigned int window_width,
            unsigned int window_height )
```

5.1.2.2 Reset()

```
void BallObject::Reset (
            glm::vec2 position,
            glm::vec2 velocity )
```

5.1.3 Member Data Documentation

5.1.3.1 Radius

```
float BallObject::Radius
```

5.1.3.2 Stuck

```
bool BallObject::Stuck
```

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

- include/game_object.h
- src/game_object.cpp

5.2 Game Class Reference

`#include <game.h>`

Public Member Functions

- Game (unsigned int width, unsigned int height)
- ~Game ()
- void Init ()
- void ProcessInput (float dt)
- void Update (float dt)
- void Render ()
- void DoCollisions ()
- void ResetPlayers ()

Public Attributes

- GameState State
- bool Keys [1024]
- unsigned int Width
- unsigned int Height

5.2.1 Constructor & Destructor Documentation

5.2.1.1 Game()

```
Game::Game (
            unsigned int width,
            unsigned int height )
```

5.2.1.2 ~Game()

```
Game::~Game ( )
```

5.2.2 Member Function Documentation

5.2.2.1 DoCollisions()

```
void Game::DoCollisions ( )
```

5.2.2.2 Init()

```
void Game::Init ( )
```

5.2.2.3 ProcessInput()

```
void Game::ProcessInput (
            float dt )
```

5.2.2.4 Render()

```
void Game::Render ( )
```

5.2.2.5 ResetPlayers()

```
void Game::ResetPlayers ( )
```

5.2.2.6 Update()

```
void Game::Update (
            float dt )
```

5.2.3 Member Data Documentation

5.2.3.1 Height

```
unsigned int Game::Height
```

5.2.3.2 Keys

```
bool Game::Keys[1024]
```

5.2.3.3 State

```
GameState Game::State
```

5.2.3.4 Width

```
unsigned int Game::Width
```

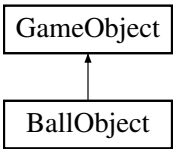
The documentation for this class was generated from the following files:

- include/game.h
- src/game.cpp

5.3 GameObject Class Reference

```
#include <game_object.h>
```

Inheritance diagram for GameObject:



Public Member Functions

- GameObject ()
- GameObject (glm::vec2 pos, glm::vec2 size, Texture2D sprite, glm::vec3 color=glm::vec3(1.0f), glm::vec2 velocity=glm::vec2(0.0f, 0.0f))
- virtual void Draw (SpriteRenderer &renderer)

Public Attributes

- glm::vec2 Position
- glm::vec2 Size
- glm::vec2 Velocity
- glm::vec3 Color
- float Rotation
- bool IsSolid
- bool Destroyed
- Texture2D Sprite

5.3.1 Constructor & Destructor Documentation

5.3.1.1 GameObject() [1/2]

```
GameObject::GameObject ( )
```

5.3.1.2 GameObject() [2/2]

```
GameObject::GameObject (
            glm::vec2 pos,
            glm::vec2 size,
            Texture2D sprite,
            glm::vec3 color = glm::vec3(1.0f),
            glm::vec2 velocity = glm::vec2(0.0f, 0.0f) )
```

5.3.2 Member Function Documentation

5.3.2.1 Draw()

```
void GameObject::Draw (
            SpriteRenderer & renderer )  [virtual]
```

5.3.3 Member Data Documentation

5.3.3.1 Color

```
glm::vec3 GameObject::Color
```

5.3.3.2 Destroyed

```
bool GameObject::Destroyed
```

5.3.3.3 IsSolid

```
bool GameObject::IsSolid
```

5.3.3.4 Position

```
glm::vec2 GameObject::Position
```

5.3.3.5 Rotation

```
float GameObject::Rotation
```

5.3.3.6 Size

```
glm::vec2 GameObject::Size
```

5.3.3.7 Sprite

```
Texture2D GameObject::Sprite
```

5.3.3.8 Velocity

```
glm::vec2 GameObject::Velocity
```

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

- include/game_object.h
- src/game_object.cpp

5.4 ResourceManager Class Reference

```
#include <resource_manager.h>
```

Static Public Member Functions

- static Shader LoadShader (const char *vShaderFile, const char *fShaderFile, const char *gShaderFile, std::string name)
- static Shader GetShader (std::string name)
- static Texture2D LoadTexture (const char *file, bool alpha, std::string name)
- static Texture2D GetTexture (std::string name)
- static void Clear ()

Static Public Attributes

- static std::map< std::string, Shader > Shaders
- static std::map< std::string, Texture2D > Textures

5.4.1 Member Function Documentation

5.4.1.1 Clear()

```
void ResourceManager::Clear ( )  [static]
```

5.4.1.2 GetShader()

```
Shader ResourceManager::GetShader (
            std::string name )  [static]
```

5.4.1.3 GetTexture()

```
Texture2D ResourceManager::GetTexture (
            std::string name )  [static]
```

5.4.1.4 LoadShader()

```
Shader ResourceManager::LoadShader (
            const char * vShaderFile,
            const char * fShaderFile,
            const char * gShaderFile,
            std::string name )  [static]
```

5.4.1.5 LoadTexture()

```
Texture2D ResourceManager::LoadTexture (
            const char * file,
            bool alpha,
            std::string name )  [static]
```

5.4.2 Member Data Documentation

5.4.2.1 Shaders

```
std::map< std::string, Shader > ResourceManager::Shaders  [static]
```

5.4.2.2 Textures

```
std::map< std::string, Texture2D > ResourceManager::Textures  [static]
```

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

- include/resource_manager.h
- src/resource_manager.cpp

5.5 Shader Class Reference

```
#include <shader.h>
```

Public Member Functions

- Shader ()
- Shader & Use ()
- void Compile (const char *vertexSource, const char *fragmentSource, const char *geometrySource=nullptr)
- void SetFloat (const char *name, float value, bool useShader=false)
- void SetInteger (const char *name, int value, bool useShader=false)
- void SetVector2f (const char *name, float x, float y, bool useShader=false)
- void SetVector2f (const char *name, const glm::vec2 &value, bool useShader=false)
- void SetVector3f (const char *name, float x, float y, float z, bool useShader=false)
- void SetVector3f (const char *name, const glm::vec3 &value, bool useShader=false)
- void SetVector4f (const char *name, float x, float y, float z, float w, bool useShader=false)
- void SetVector4f (const char *name, const glm::vec4 &value, bool useShader=false)
- void SetMatrix4 (const char *name, const glm::mat4 &matrix, bool useShader=false)
- Shader (const char *vertexPath, const char *fragmentPath)
- void use ()
- void setBool (const std::string &name, bool value) const
- void setInt (const std::string &name, int value) const
- void setFloat (const std::string &name, float value) const

Public Attributes

- unsigned int ID

5.5.1 Constructor & Destructor Documentation

5.5.1.1 Shader() [1/2]

```
Shader::Shader ( )  [inline]
```

5.5.1.2 Shader() [2/2]

```
Shader::Shader (
            const char * vertexPath,
            const char * fragmentPath )  [inline]
```

5.5.2 Member Function Documentation

5.5.2.1 Compile()

```
void Shader::Compile (
            const char * vertexSource,
            const char * fragmentSource,
            const char * geometrySource = nullptr )
```

5.5.2.2 setBool()

```
void Shader::setBool (
            const std::string & name,
            bool value ) const  [inline]
```

5.5.2.3 SetFloat()

```
void Shader::SetFloat (
            const char * name,
            float value,
            bool useShader = false )
```

5.5.2.4 setFloat()

```
void Shader::setFloat (
            const std::string & name,
            float value ) const  [inline]
```

5.5.2.5 setInt()

```
void Shader::setInt (
            const std::string & name,
            int value ) const  [inline]
```

5.5.2.6 SetInteger()

```
void Shader::SetInteger (
            const char * name,
            int value,
            bool useShader = false )
```

5.5.2.7 SetMatrix4()

```
void Shader::SetMatrix4 (
            const char * name,
            const glm::mat4 & matrix,
            bool useShader = false )
```

5.5.2.8 SetVector2f() [1/2]

```
void Shader::SetVector2f (
            const char * name,
            const glm::vec2 & value,
            bool useShader = false )
```

5.5.2.9 SetVector2f() [2/2]

```
void Shader::SetVector2f (
            const char * name,
            float x,
            float y,
            bool useShader = false )
```

5.5.2.10 SetVector3f() [1/2]

```
void Shader::SetVector3f (
            const char * name,
            const glm::vec3 & value,
            bool useShader = false )
```

5.5.2.11 SetVector3f() [2/2]

```
void Shader::SetVector3f (
            const char * name,
            float x,
            float y,
            float z,
            bool useShader = false )
```

5.5.2.12 SetVector4f() [1/2]

```
void Shader::SetVector4f (
            const char * name,
            const glm::vec4 & value,
            bool useShader = false )
```

5.5.2.13 SetVector4f() [2/2]

```
void Shader::SetVector4f (
            const char * name,
            float x,
            float y,
            float z,
            float w,
            bool useShader = false )
```

5.5.2.14 Use()

```
Shader & Shader::Use ( )
```

5.5.2.15 use()

```
void Shader::use ( )  [inline]
```

5.5.3 Member Data Documentation

5.5.3.1 ID

```
unsigned int Shader::ID
```

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

- include/shader.h
- include/shader_s.h
- src/shader.cpp

5.6 SpriteRenderer Class Reference

```
#include <sprite_renderer.h>
```

Public Member Functions

- SpriteRenderer (const Shader &shader)
- ~SpriteRenderer ()
- void DrawSprite (const Texture2D &texture, glm::vec2 position, glm::vec2 size=glm::vec2(10.0f, 10.0f), float rotate=0.0f, glm::vec3 color=glm::vec3(1.0f))

5.6.1 Constructor & Destructor Documentation

5.6.1.1 SpriteRenderer()

```
SpriteRenderer::SpriteRenderer (
            const Shader & shader )
```

5.6.1.2 ~SpriteRenderer()

```
SpriteRenderer::~SpriteRenderer ( )
```

5.6.2 Member Function Documentation

5.6.2.1 DrawSprite()

```
void SpriteRenderer::DrawSprite (
            const Texture2D & texture,
            glm::vec2 position,
            glm::vec2 size = glm::vec2(10.0f, 10.0f),
            float rotate = 0.0f,
            glm::vec3 color = glm::vec3(1.0f) )
```

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

- include/sprite_renderer.h
- src/sprite_renderer.cpp

5.7 Texture2D Class Reference

```
#include <texture.h>
```

Public Member Functions

- Texture2D ()
- void Generate (unsigned int width, unsigned int height, unsigned char *data)
- void Bind () const

Public Attributes

- unsigned int ID
- unsigned int Width
- unsigned int Height
- unsigned int Internal_Format
- unsigned int Image_Format
- unsigned int Wrap_S
- unsigned int Wrap_T
- unsigned int Filter_Min
- unsigned int Filter_Max

5.7.1 Constructor & Destructor Documentation

5.7.1.1 Texture2D()

```
Texture2D::Texture2D ( )
```

5.7.2 Member Function Documentation

5.7.2.1 Bind()

```
void Texture2D::Bind ( ) const
```

5.7.2.2 Generate()

```
void Texture2D::Generate (
            unsigned int width,
            unsigned int height,
            unsigned char * data )
```

5.7.3 Member Data Documentation

5.7.3.1 Filter_Max

```
unsigned int Texture2D::Filter_Max
```

5.7.3.2 Filter_Min

```
unsigned int Texture2D::Filter_Min
```

5.7.3.3 Height

```
unsigned int Texture2D::Height
```

5.7.3.4 ID

```
unsigned int Texture2D::ID
```

5.7.3.5 Image_Format

```
unsigned int Texture2D::Image_Format
```

5.7.3.6 Internal_Format

```
unsigned int Texture2D::Internal_Format
```

5.7.3.7 Width

```
unsigned int Texture2D::Width
```

5.7.3.8 Wrap_S

```
unsigned int Texture2D::Wrap_S
```

5.7.3.9 Wrap_T

```
unsigned int Texture2D::Wrap_T
```

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

- include/texture.h
- src/texture.cpp

Chapter 6

File Documentation

6.1 include/game.h File Reference

```
#include <glad/glad.h>
#include <GLFW/glfw3.h>
```

Classes

- class Game

Enumerations

- enum GameState { GAME_ACTIVE , GAME_MENU , GAME_WIN }

6.1.1 Enumeration Type Documentation

6.1.1.1 GameState

```
enum GameState
```

Enumerator

GAME_ACTIVE	
GAME_MENU	
GAME_WIN	

6.2 game.h

Go to the documentation of this file.

```
1 #ifndef GAME_H
2 #define GAME_H
3
4 #include <glad/glad.h>
5 #include <GLFW/glfw3.h>
6
7 // Represents the current state of the game
8 enum GameState {
9     GAME_ACTIVE,
10     GAME_MENU,
11     GAME_WIN
12 };
13
14 // Game holds all game-related state and functionality.
15 // Combines all game-related data into a single class for
16 // easy access to each of the components and manageability.
17 class Game
18 {
19 public:
20     // game state
21     GameState               State;
22     bool                    Keys[1024];
23     unsigned int            Width, Height;
24     // constructor/destructor
25     Game(unsigned int width, unsigned int height);
26     ~Game();
27     // initialize game state (load all shaders/textures/levels)
28     void Init();
29     // game loop
30     void ProcessInput(float dt);
31     void Update(float dt);
32     void Render();
33
34     void DoCollisions();
35     // reset
36     void ResetPlayers();
37 };
38
39 #endif
```

6.3 include/game_object.h File Reference

```
#include <glad/glad.h>
#include <glm/glm.hpp>
#include "texture.h"
#include "sprite_renderer.h"
```

Classes

- class GameObject
- class BallObject

6.4 game_object.h

Go to the documentation of this file.

```
1 #ifndef GAMEOBJECT_H
2 #define GAMEOBJECT_H
3
4 #include <glad/glad.h>
5 #include <glm/glm.hpp>
6
7 #include "texture.h"
```

```
8 #include "sprite_renderer.h"
9
10
11 /* GAMEOBJECT CLASS*/
12 // Container object for holding all state relevant for a single
13 // game object entity. Each object in the game likely needs the
14 // minimal of state as described within GameObject.
15 class GameObject
16 {
17 public:
18     // object state
19     glm::vec2   Position, Size, Velocity;
20     glm::vec3   Color;
21     float       Rotation;
22     bool        IsSolid;
23     bool        Destroyed;
24     // render state
25     Texture2D   Sprite;
26     // constructor(s)
27     GameObject();
28     GameObject(glm::vec2 pos, glm::vec2 size, Texture2D sprite, glm::vec3 color = glm::vec3(1.0f),
       glm::vec2 velocity = glm::vec2(0.0f, 0.0f));
29     // draw sprite
30     virtual void Draw(SpriteRenderer &renderer);
31 };
32
33 /* BALLOBJECT CLASS*/
34 class BallObject : public GameObject
35 {
36     public:
37         //ball state
38         float Radius;
39         bool Stuck;
40
41         BallObject();
42         BallObject(glm::vec2 pos, float radius, glm::vec2 velocity, Texture2D sprite);
43
44         glm::vec2 Move(float dt, unsigned int window_width, unsigned int window_height);
45         void      Reset(glm::vec2 position, glm::vec2 velocity);
46 };
47
48 #endif
```

6.5 include/resource_manager.h File Reference

```
#include <map>
#include <string>
#include <glad/glad.h>
#include "texture.h"
#include "shader.h"
```

Classes

- class ResourceManager

6.6 resource_manager.h

Go to the documentation of this file.

```
1 #ifndef RESOURCE_MANAGER_H
2 #define RESOURCE_MANAGER_H
3
4 #include <map>
5 #include <string>
6
7 #include <glad/glad.h>
8
9 #include "texture.h"
10 #include "shader.h"
```

```
11
12
13 // A static singleton ResourceManager class that hosts several
14 // functions to load Textures and Shaders. Each loaded texture
15 // and/or shader is also stored for future reference by string
16 // handles. All functions and resources are static and no
17 // public constructor is defined.
18 class ResourceManager
19 {
20 public:
21     // resource storage
22     static std::map<std::string, Shader>    Shaders;
23     static std::map<std::string, Texture2D> Textures;
24     // loads (and generates) a shader program from file loading vertex, fragment (and geometry) shader's
       source code. If gShaderFile is not nullptr, it also loads a geometry shader
25     static Shader    LoadShader(const char *vShaderFile, const char *fShaderFile, const char
       *gShaderFile, std::string name);
26     // retrieves a stored sader
27     static Shader    GetShader(std::string name);
28     // loads (and generates) a texture from file
29     static Texture2D LoadTexture(const char *file, bool alpha, std::string name);
30     // retrieves a stored texture
31     static Texture2D GetTexture(std::string name);
32     // properly de-allocates all loaded resources
33     static void      Clear();
34 private:
35     // private constructor, that is we do not want any actual resource manager objects. Its members and
       functions should be publicly available (static).
36     ResourceManager() { }
37     // loads and generates a shader from file
38     static Shader    loadShaderFromFile(const char *vShaderFile, const char *fShaderFile, const char
       *gShaderFile = nullptr);
39     // loads a single texture from file
40     static Texture2D loadTextureFromFile(const char *file, bool alpha);
41 };
42
43 #endif
```

6.7 include/shader.h File Reference

```
#include <string>
#include <glad/glad.h>
#include <glm/glm.hpp>
#include <glm/gtc/type_ptr.hpp>
```

Classes

- class Shader

6.8 shader.h

Go to the documentation of this file.

```
1 #ifndef SHADER_H
2 #define SHADER_H
3
4 #include <string>
5
6 #include <glad/glad.h>
7 #include <glm/glm.hpp>
8 #include <glm/gtc/type_ptr.hpp>
9
10
11 // General purpsoe shader object. Compiles from file, generates
12 // compile/link-time error messages and hosts several utility
13 // functions for easy management.
14 class Shader
15 {
16 public:
```

```
17     // state
18     unsigned int ID;
19     // constructor
20     Shader() { }
21     // sets the current shader as active
22     Shader  &Use();
23     // compiles the shader from given source code
24     void    Compile(const char *vertexSource, const char *fragmentSource, const char *geometrySource =
       nullptr); // note: geometry source code is optional
25     // utility functions
26     void    SetFloat    (const char *name, float value, bool useShader = false);
27     void    SetInteger  (const char *name, int value, bool useShader = false);
28     void    SetVector2f (const char *name, float x, float y, bool useShader = false);
29     void    SetVector2f (const char *name, const glm::vec2 &value, bool useShader = false);
30     void    SetVector3f (const char *name, float x, float y, float z, bool useShader = false);
31     void    SetVector3f (const char *name, const glm::vec3 &value, bool useShader = false);
32     void    SetVector4f (const char *name, float x, float y, float z, float w, bool useShader = false);
33     void    SetVector4f (const char *name, const glm::vec4 &value, bool useShader = false);
34     void    SetMatrix4  (const char *name, const glm::mat4 &matrix, bool useShader = false);
35 private:
36     // checks if compilation or linking failed and if so, print the error logs
37     void    checkCompileErrors(unsigned int object, std::string type);
38 };
39
40 #endif
```

6.9 include/shader_s.h File Reference

```
#include <glad/glad.h>
#include <string>
#include <fstream>
#include <sstream>
#include <iostream>
```

Classes

- class Shader

6.10 shader_s.h

Go to the documentation of this file.

```
1 #ifndef SHADER_H
2 #define SHADER_H
3
4 #include <glad/glad.h>
5
6 #include <string>
7 #include <fstream>
8 #include <sstream>
9 #include <iostream>
10
11 class Shader
12 {
13 public:
14     unsigned int ID;
15     // constructor generates the shader on the fly
16     // ------------------------------------------------------------------------
17     Shader(const char* vertexPath, const char* fragmentPath)
18     {
19         // 1. retrieve the vertex/fragment source code from filePath
20         std::string vertexCode;
21         std::string fragmentCode;
22         std::ifstream vShaderFile;
23         std::ifstream fShaderFile;
24         // ensure ifstream objects can throw exceptions:
25         vShaderFile.exceptions (std::ifstream::failbit | std::ifstream::badbit);
26         fShaderFile.exceptions (std::ifstream::failbit | std::ifstream::badbit);
27         try
```

```
28          {
29              // open files
30              vShaderFile.open(vertexPath);
31              fShaderFile.open(fragmentPath);
32              std::stringstream vShaderStream, fShaderStream;
33              // read file's buffer contents into streams
34              vShaderStream << vShaderFile.rdbuf();
35              fShaderStream << fShaderFile.rdbuf();
36              // close file handlers
37              vShaderFile.close();
38              fShaderFile.close();
39              // convert stream into string
40              vertexCode   = vShaderStream.str();
41              fragmentCode = fShaderStream.str();
42          }
43          catch (std::ifstream::failure& e)
44          {
45              std::cout << "ERROR::SHADER::FILE_NOT_SUCCESFULLY_READ: " << e.what() << std::endl;
46          }
47          const char* vShaderCode = vertexCode.c_str();
48          const char * fShaderCode = fragmentCode.c_str();
49          // 2. compile shaders
50          unsigned int vertex, fragment;
51          // vertex shader
52          vertex = glCreateShader(GL_VERTEX_SHADER);
53          glShaderSource(vertex, 1, &vShaderCode, NULL);
54          glCompileShader(vertex);
55          checkCompileErrors(vertex, "VERTEX");
56          // fragment Shader
57          fragment = glCreateShader(GL_FRAGMENT_SHADER);
58          glShaderSource(fragment, 1, &fShaderCode, NULL);
59          glCompileShader(fragment);
60          checkCompileErrors(fragment, "FRAGMENT");
61          // shader Program
62          ID = glCreateProgram();
63          glAttachShader(ID, vertex);
64          glAttachShader(ID, fragment);
65          glLinkProgram(ID);
66          checkCompileErrors(ID, "PROGRAM");
67          // delete the shaders as they're linked into our program now and no longer necessary
68          glDeleteShader(vertex);
69          glDeleteShader(fragment);
70      }
71      // activate the shader
72      // ------------------------------------------------------------------------
73      void use()
74      {
75          glUseProgram(ID);
76      }
77      // utility uniform functions
78      // ------------------------------------------------------------------------
79      void setBool(const std::string &name, bool value) const
80      {
81          glUniform1i(glGetUniformLocation(ID, name.c_str()), (int)value);
82      }
83      // ------------------------------------------------------------------------
84      void setInt(const std::string &name, int value) const
85      {
86          glUniform1i(glGetUniformLocation(ID, name.c_str()), value);
87      }
88      // ------------------------------------------------------------------------
89      void setFloat(const std::string &name, float value) const
90      {
91          glUniform1f(glGetUniformLocation(ID, name.c_str()), value);
92      }
93
94  private:
95      // utility function for checking shader compilation/linking errors.
96      // ------------------------------------------------------------------------
97      void checkCompileErrors(unsigned int shader, std::string type)
98      {
99          int success;
100         char infoLog[1024];
101         if (type != "PROGRAM")
102         {
103             glGetShaderiv(shader, GL_COMPILE_STATUS, &success);
104             if (!success)
105             {
106                 glGetShaderInfoLog(shader, 1024, NULL, infoLog);
107                 std::cout << "ERROR::SHADER_COMPILATION_ERROR of type: " << type << "\n" << infoLog << "\n --
    ---------------------------------------------------- -- " << std::endl;
108             }
109         }
110         else
111         {
112             glGetProgramiv(shader, GL_LINK_STATUS, &success);
113             if (!success)
```

```
114             {
115                 glGetProgramInfoLog(shader, 1024, NULL, infoLog);
116                 std::cout « "ERROR::PROGRAM_LINKING_ERROR of type: " « type « "\n" « infoLog « "\n --
      ---------------------------------------------------- -- " « std::endl;
117             }
118         }
119     }
120 };
121 #endif
```

6.11 include/sprite_renderer.h File Reference

```
#include <glad/glad.h>
#include <glm/glm.hpp>
#include <glm/gtc/matrix_transform.hpp>
#include "texture.h"
#include "shader.h"
```

Classes

- class SpriteRenderer

6.12 sprite_renderer.h

Go to the documentation of this file.

```
1 #ifndef SPRITE_RENDERER_H
2 #define SPRITE_RENDERER_H
3
4 #include <glad/glad.h>
5 #include <glm/glm.hpp>
6 #include <glm/gtc/matrix_transform.hpp>
7
8 #include "texture.h"
9 #include "shader.h"
10
11
12 class SpriteRenderer
13 {
14 public:
15     // Constructor (inits shaders/shapes)
16     SpriteRenderer(const Shader &shader);
17     // Destructor
18     ~SpriteRenderer();
19     // Renders a defined quad textured with given sprite
20     void DrawSprite(const Texture2D &texture, glm::vec2 position, glm::vec2 size = glm::vec2(10.0f,
       10.0f), float rotate = 0.0f, glm::vec3 color = glm::vec3(1.0f));
21 private:
22     // Render state
23     Shader       shader;
24     unsigned int quadVAO;
25     // Initializes and configures the quad's buffer and vertex attributes
26     void initRenderData();
27 };
28
29 #endif
```

6.13 include/texture.h File Reference

```
#include <glad/glad.h>
```

Classes

- class Texture2D

6.14 texture.h

Go to the documentation of this file.

```
1 #ifndef TEXTURE_H
2 #define TEXTURE_H
3
4 #include <glad/glad.h>
5
6 // Texture2D is able to store and configure a texture in OpenGL.
7 // It also hosts utility functions for easy management.
8 class Texture2D
9 {
10 public:
11     // holds the ID of the texture object, used for all texture operations to reference to this particlar
      texture
12     unsigned int ID;
13     // texture image dimensions
14     unsigned int Width, Height; // width and height of loaded image in pixels
15     // texture Format
16     unsigned int Internal_Format; // format of texture object
17     unsigned int Image_Format; // format of loaded image
18     // texture configuration
19     unsigned int Wrap_S; // wrapping mode on S axis
20     unsigned int Wrap_T; // wrapping mode on T axis
21     unsigned int Filter_Min; // filtering mode if texture pixels < screen pixels
22     unsigned int Filter_Max; // filtering mode if texture pixels > screen pixels
23     // constructor (sets default texture modes)
24     Texture2D();
25     // generates texture from image data
26     void Generate(unsigned int width, unsigned int height, unsigned char* data);
27     // binds the texture as the current active GL_TEXTURE_2D texture object
28     void Bind() const;
29 };
30
31 #endif
```

6.15 README.md File Reference

6.16 src/game.cpp File Reference

```
#include "game.h"
#include "resource_manager.h"
#include "sprite_renderer.h"
#include "game_object.h"
```

Typedefs

- typedef std::tuple< bool, Direction, glm::vec2 > Collision

Enumerations

- enum Direction { UP , RIGHT , DOWN , LEFT }

Functions

- const glm::vec2 INITIAL_BALL_VELOCITY (100.0f, -350.0f)
- const float PLAYER_VELOCITY (500.0f)
- const glm::vec2 PLAYER_SIZE (100.0f, 200.0f)
- bool CheckCollision (GameObject &one, GameObject &two)
- Collision CheckCollision (BallObject &one, GameObject &two)
- Direction VectorDirection (glm::vec2 closest)

Variables

- SpriteRenderer * Renderer
- const float BALL_RADIUS = 25.0f
- BallObject * Ball
- GameObject * Player1
- GameObject * Player2

6.16.1 Typedef Documentation

6.16.1.1 Collision

```
typedef std::tuple<bool, Direction, glm::vec2> Collision
```

6.16.2 Enumeration Type Documentation

6.16.2.1 Direction

```
enum Direction
```

Enumerator

UP	
RIGHT	
DOWN	
LEFT	

6.16.3 Function Documentation

6.16.3.1 CheckCollision() [1/2]

```
Collision CheckCollision (
            BallObject & one,
            GameObject & two )
```

6.16.3.2 CheckCollision() [2/2]

```
bool CheckCollision (
            GameObject & one,
            GameObject & two )
```

6.16.3.3 INITIAL_BALL_VELOCITY()

```
const glm::vec2 INITIAL_BALL_VELOCITY (
            100.  0f,
            -350.  0f )
```

6.16.3.4 PLAYER_SIZE()

```
const glm::vec2 PLAYER_SIZE (
            100.  0f,
            200.  0f )
```

6.16.3.5 PLAYER_VELOCITY()

```
const float PLAYER_VELOCITY (
            500.  0f )
```

6.16.3.6 VectorDirection()

```
Direction VectorDirection (
            glm::vec2 closest )
```

6.16.4 Variable Documentation

6.16.4.1 Ball

```
BallObject* Ball
```

6.16.4.2 BALL_RADIUS

```
const float BALL_RADIUS = 25.0f
```

6.16.4.3 Player1

```
GameObject* Player1
```

6.16.4.4 Player2

```
GameObject* Player2
```

6.16.4.5 Renderer

```
SpriteRenderer* Renderer
```

6.17 src/game_object.cpp File Reference

```
#include "game_object.h"
```

6.18 src/main.cpp File Reference

```
#include <glad/glad.h>
#include <GLFW/glfw3.h>
#include "game.h"
#include "resource_manager.h"
#include <iostream>
```

Functions

- void framebuffer_size_callback (GLFWwindow ∗window, int width, int height)
- void key_callback (GLFWwindow ∗window, int key, int scancode, int action, int mode)
- int main (int argc, char ∗argv[ ])

Variables

- const unsigned int SCREEN_WIDTH = 800
- const unsigned int SCREEN_HEIGHT = 600
- Game Headsoccer (SCREEN_WIDTH, SCREEN_HEIGHT)

6.18.1 Function Documentation

6.18.1.1 framebuffer_size_callback()

```
void framebuffer_size_callback (
            GLFWwindow * window,
            int width,
            int height )
```

6.18.1.2 key_callback()

```
void key_callback (
            GLFWwindow * window,
            int key,
            int scancode,
            int action,
            int mode )
```

6.18.1.3 main()

```
int main (
            int argc,
            char * argv[] )
```

6.18.2 Variable Documentation

6.18.2.1 Headsoccer

```
Game Headsoccer(SCREEN_WIDTH, SCREEN_HEIGHT) (
            SCREEN_WIDTH ,
            SCREEN_HEIGHT  )
```

6.18.2.2 SCREEN_HEIGHT

```
const unsigned int SCREEN_HEIGHT = 600
```

6.18.2.3 SCREEN_WIDTH

```
const unsigned int SCREEN_WIDTH = 800
```

6.19 src/resource_manager.cpp File Reference

```
#include "resource_manager.h"
#include <iostream>
#include <sstream>
#include <fstream>
#include "stb_image.h"
```

6.20 src/shader.cpp File Reference

```
#include "shader.h"
#include <iostream>
```

6.21 src/sprite_renderer.cpp File Reference

```
#include "sprite_renderer.h"
```

6.22 src/texture.cpp File Reference

```
#include <iostream>
#include "texture.h"
```

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