



# Anatomy of a role playing game

2012-02-05

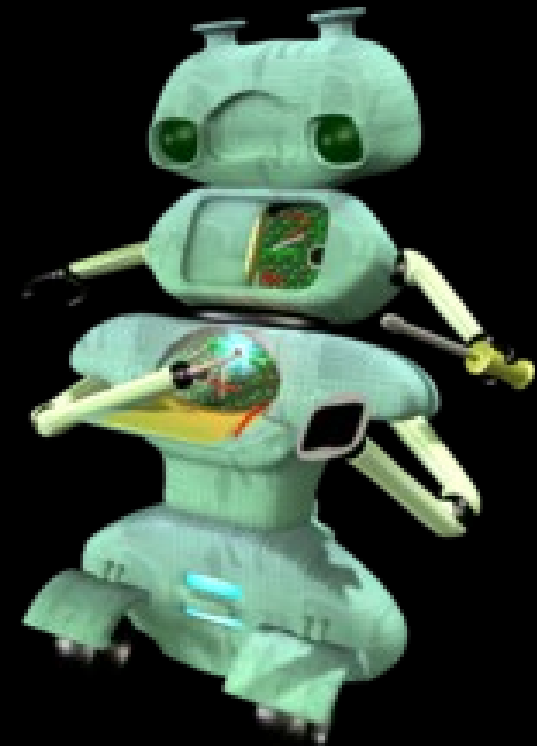
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# FreedroidRPG



# Description

- Humanity's robots have turned against it
- Isometric 3D role playing game
- Real time action
- Roleplaying through dialogs and quests
- Minigame turning on enemies to your side



# Facts

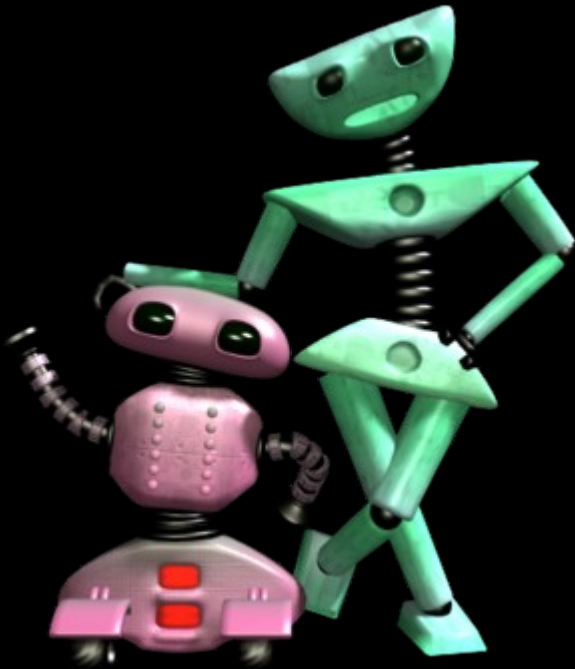


- Fully playable on many platforms
- 12h of fun
- 60 non playing characters to chat with
- 50,000 words of dialogs
- 14 original music tracks
- 75 downloads a day from Sourceforge.net

# Demo video



# Project goals



- Be enjoyable by kids and adults alike
- Support most platforms and hardware
- Single player

# History



2002

**FreedroidRPG started  
by Johannes Prix**



# History

2004

**Arthur takes charge of  
the project**





# History



2007

0.10.1 introduces  
translation support



# History



2009



Feb - FOSDEM lightning talk about FreedroidRPG

Dec - Translations removed in 0.13

# History



2010

Aug - Google Summer of Code with 3 students

- leveleditor improvements
- random dungeon generator
- item upgrade mechanism

Nov - 0.14, richer, faster, nicer

# History



2011

Aug - Google Summer of Code with 4 students

- 2D GUI refactoring
- OpenGL performance improvements
- script engine improvements
- leveleditor improvements

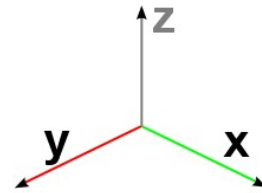
Dec - 0.15 is released, improvements all across the board

# High-level engine overview



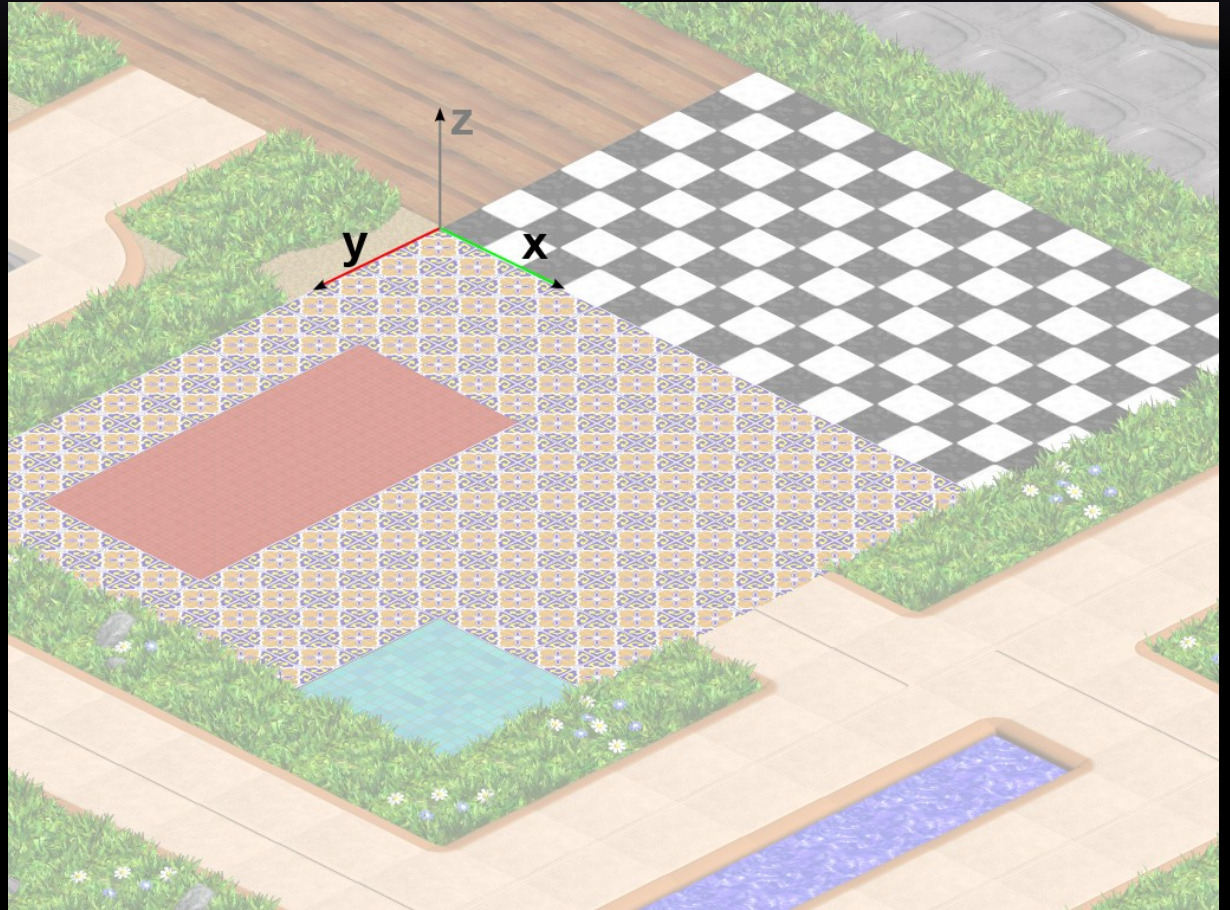
# Game world

- Coordinate system



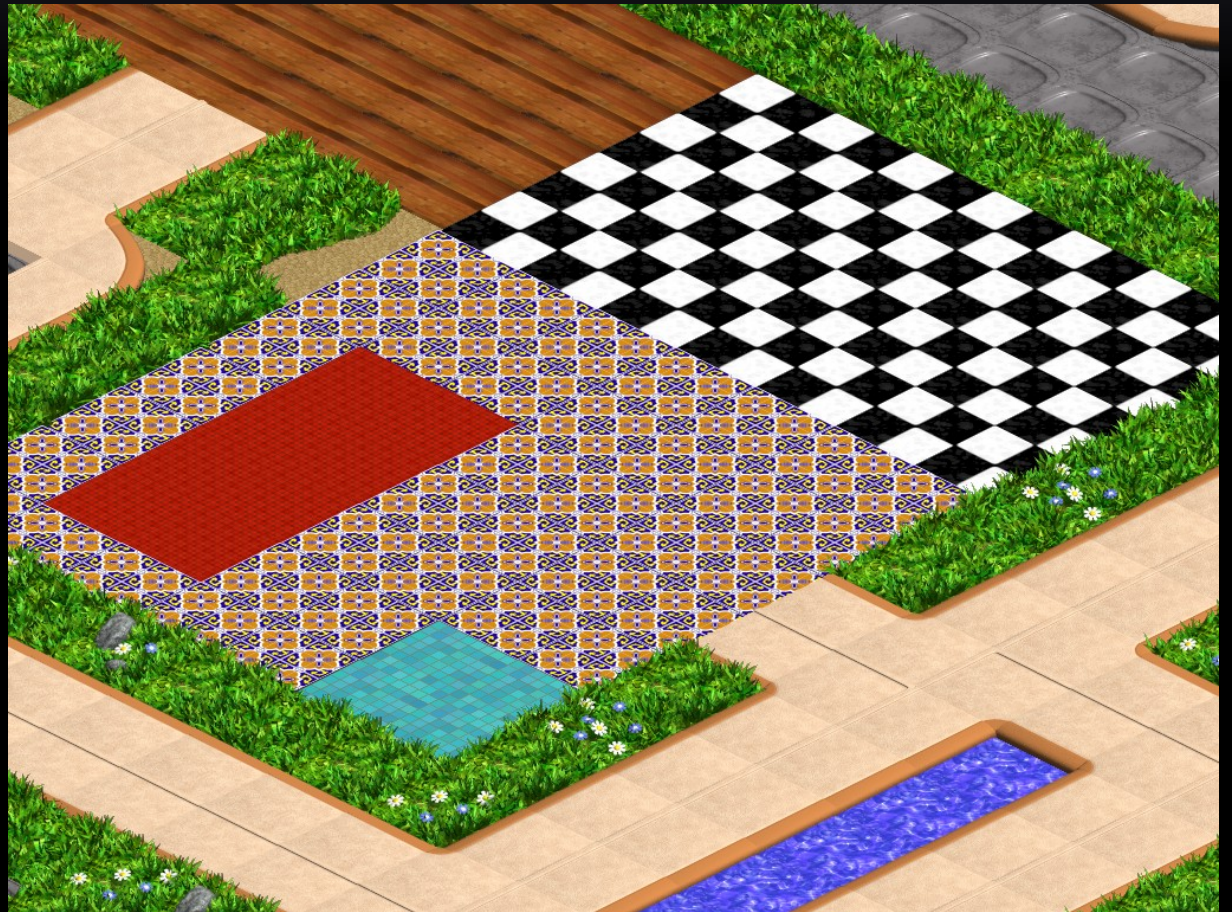
# Game world

- Coordinate system



# Game world

- Coordinate system
- Floor tiles





# Game world

- Coordinate system
- Floor tiles
- Obstacles



# Game world

- Coordinate system
- Floor tiles
- Obstacles



# Game world

- Coordinate system
- Floor tiles
- Obstacles
- Actors



# Game world

- Coordinate system
- Floor tiles
- Obstacles
- Actors
- Bullets, explosions
- Events
- Dropped items



# FreedroidRPG modules

```
graph TD; A([FreedroidRPG modules]) --- B[Actions]; A --- C[World simulation]; A --- D[Display];
```

Actions

World simulation

Display

# FreedroidRPG modules

```
graph TD; Root([FreedroidRPG modules]) --- Actions[Actions]; Root --- World[World simulation]; Root --- Display[Display]; Actions --- User([User input]); Actions --- AI([AI]); Actions --- Scripting([Scripting interface]);
```

Actions

World simulation

Display

User input

AI

Scripting interface

# FreedroidRPG modules

Actions

World simulation

Display

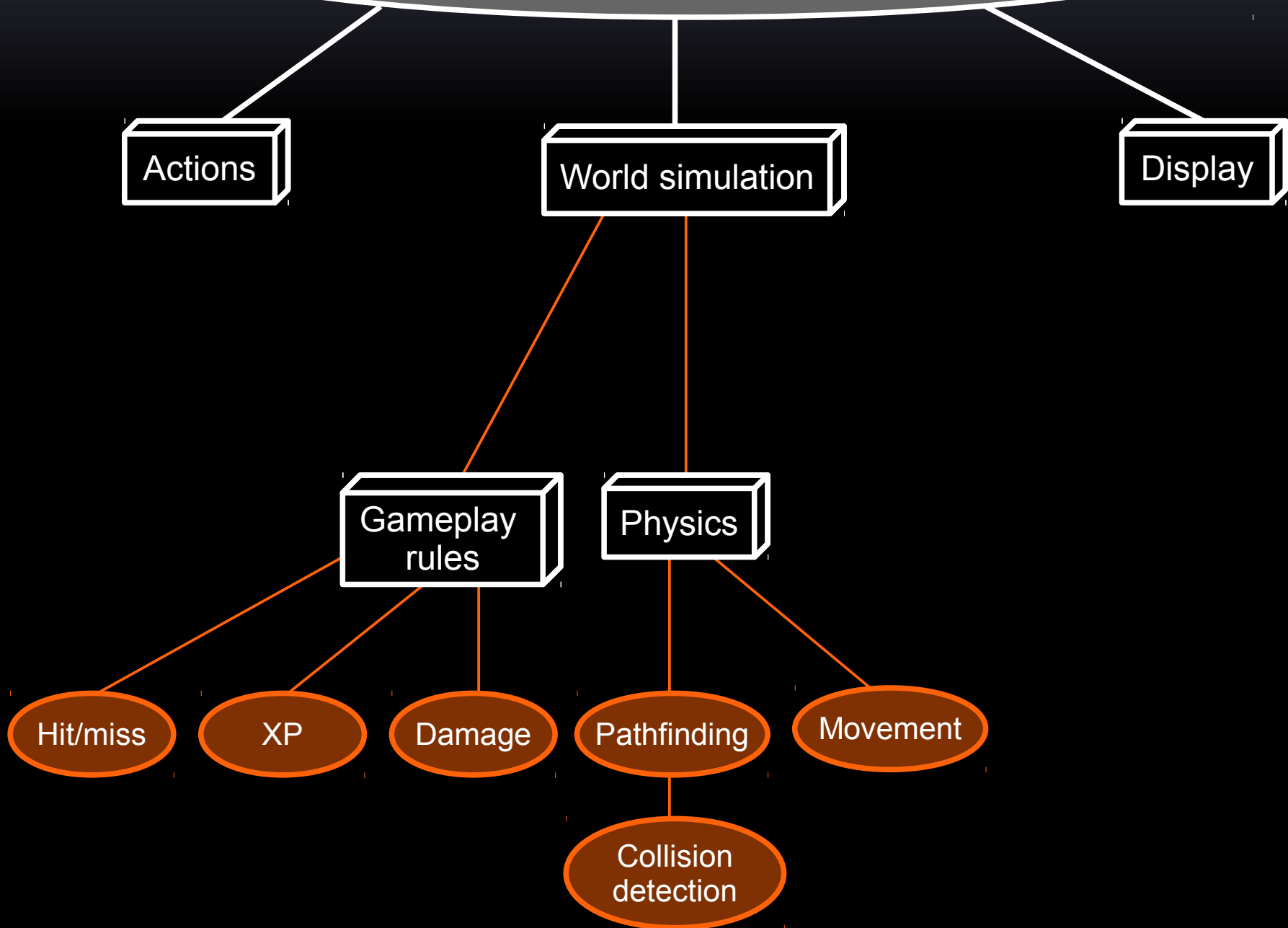
Gameplay  
rules

Hit/miss

XP

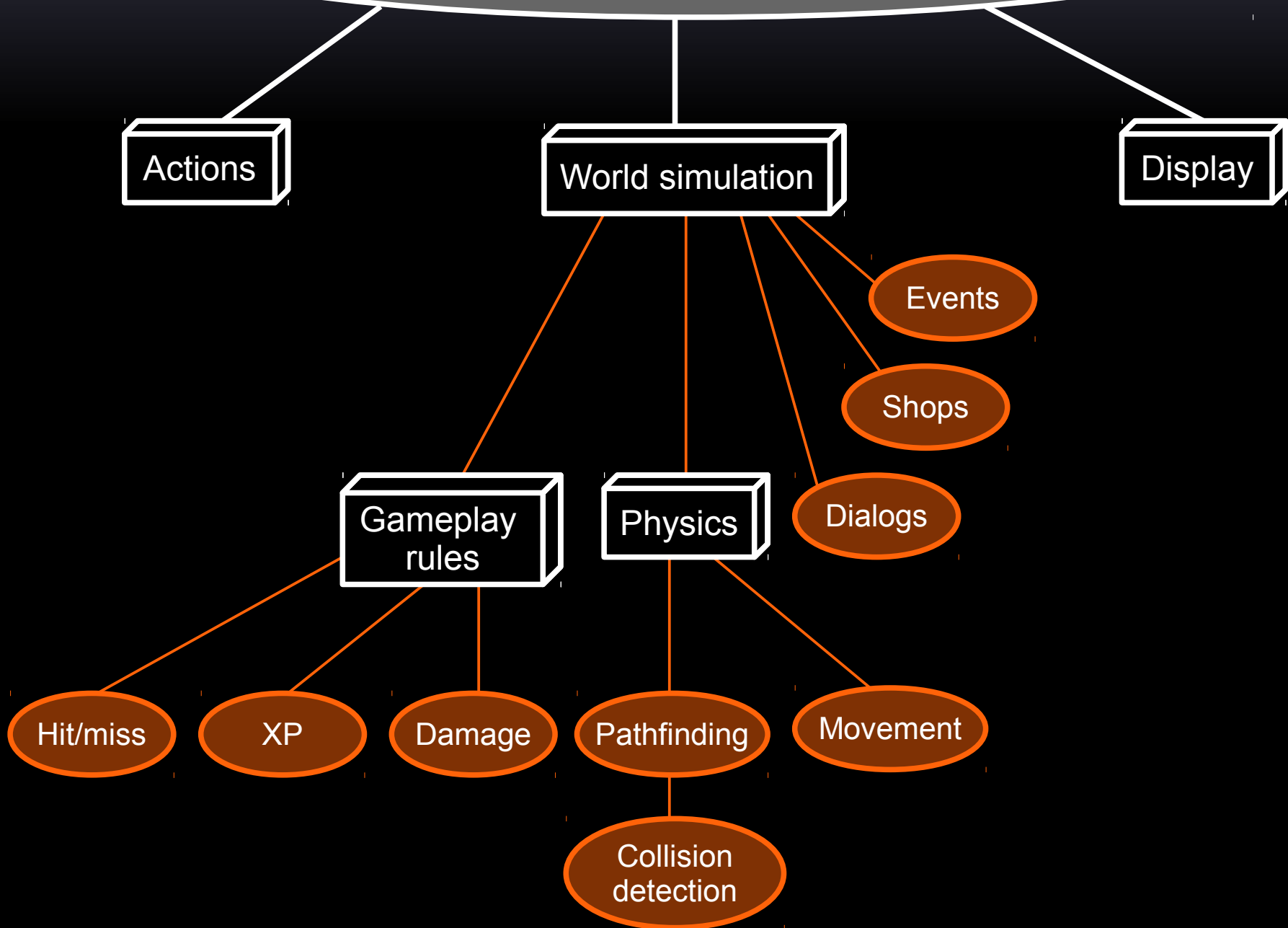
Damage

# FreedroidRPG modules





# FreedroidRPG modules



# FreedroidRPG modules

```
graph TD; Root([FreedroidRPG modules]) --- Actions[Actions]; Root --- World[World simulation]; Root --- Display[Display]; Display --- 3D([3D world]); Display --- 2D([2D GUI]);
```

Actions

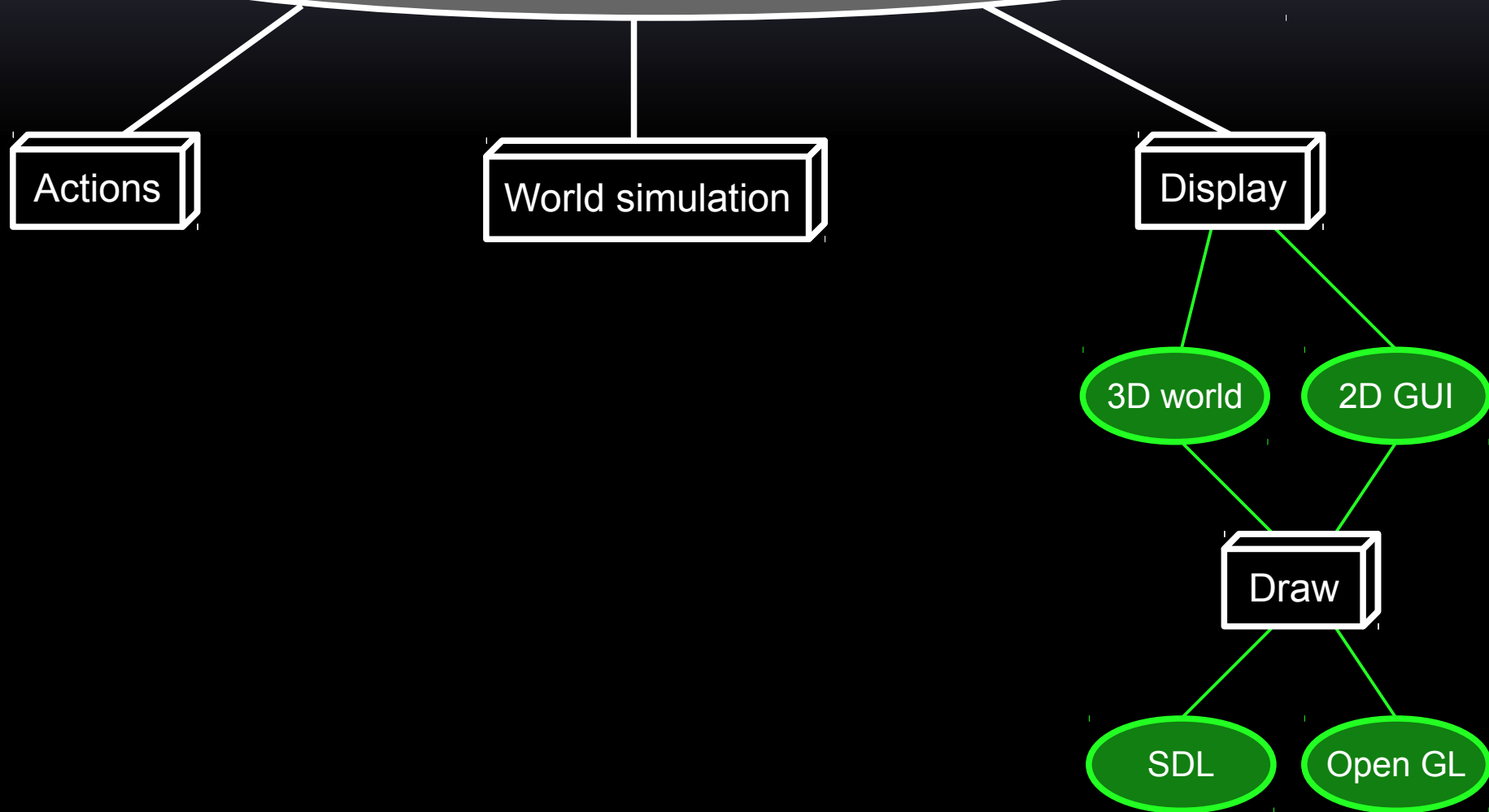
World simulation

Display

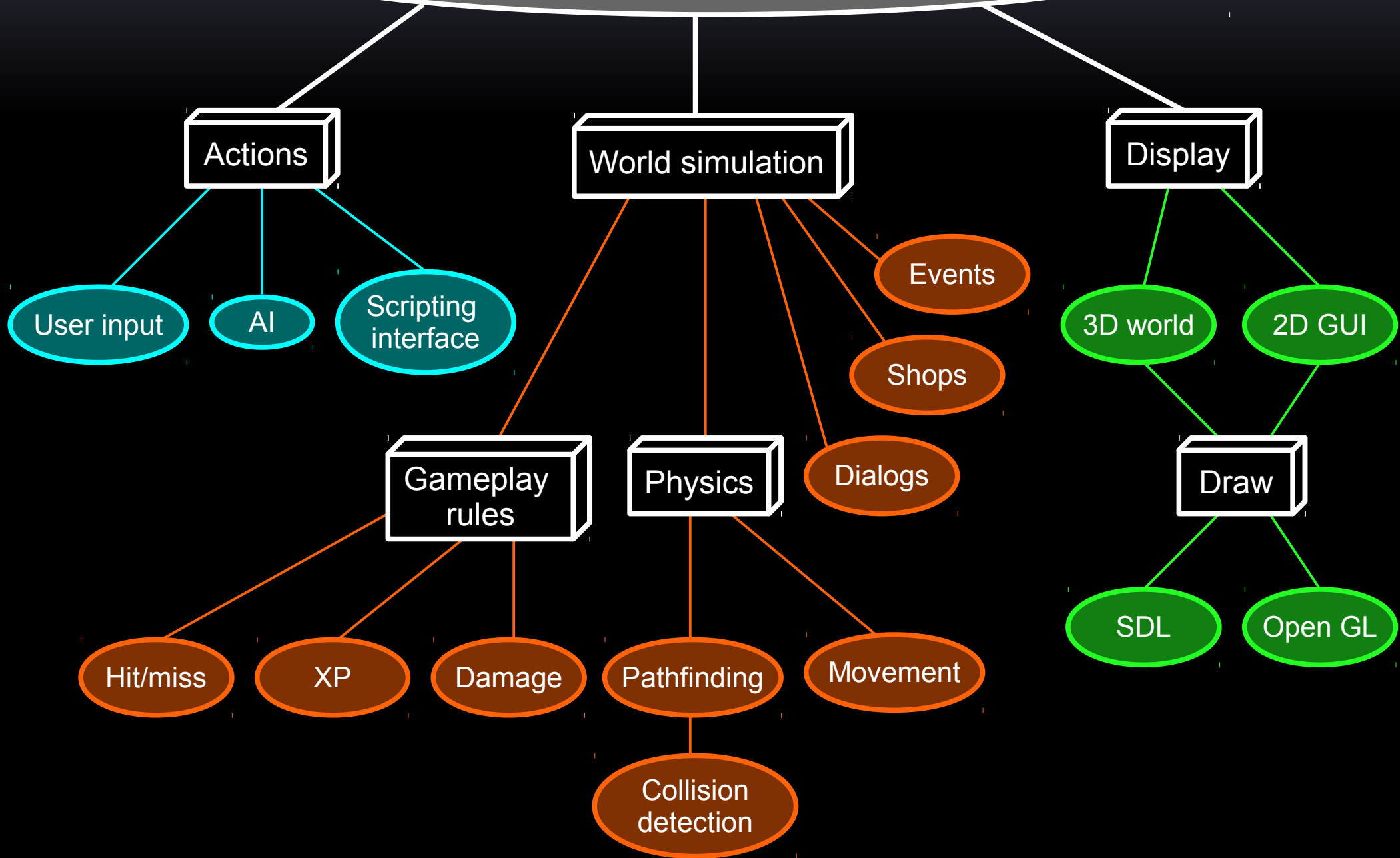
3D world

2D GUI

# FreedroidRPG modules

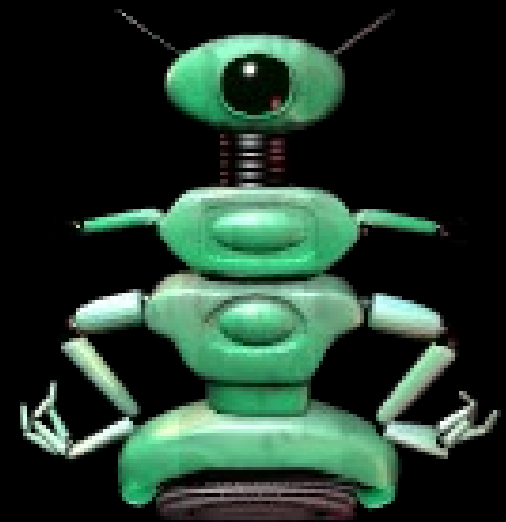
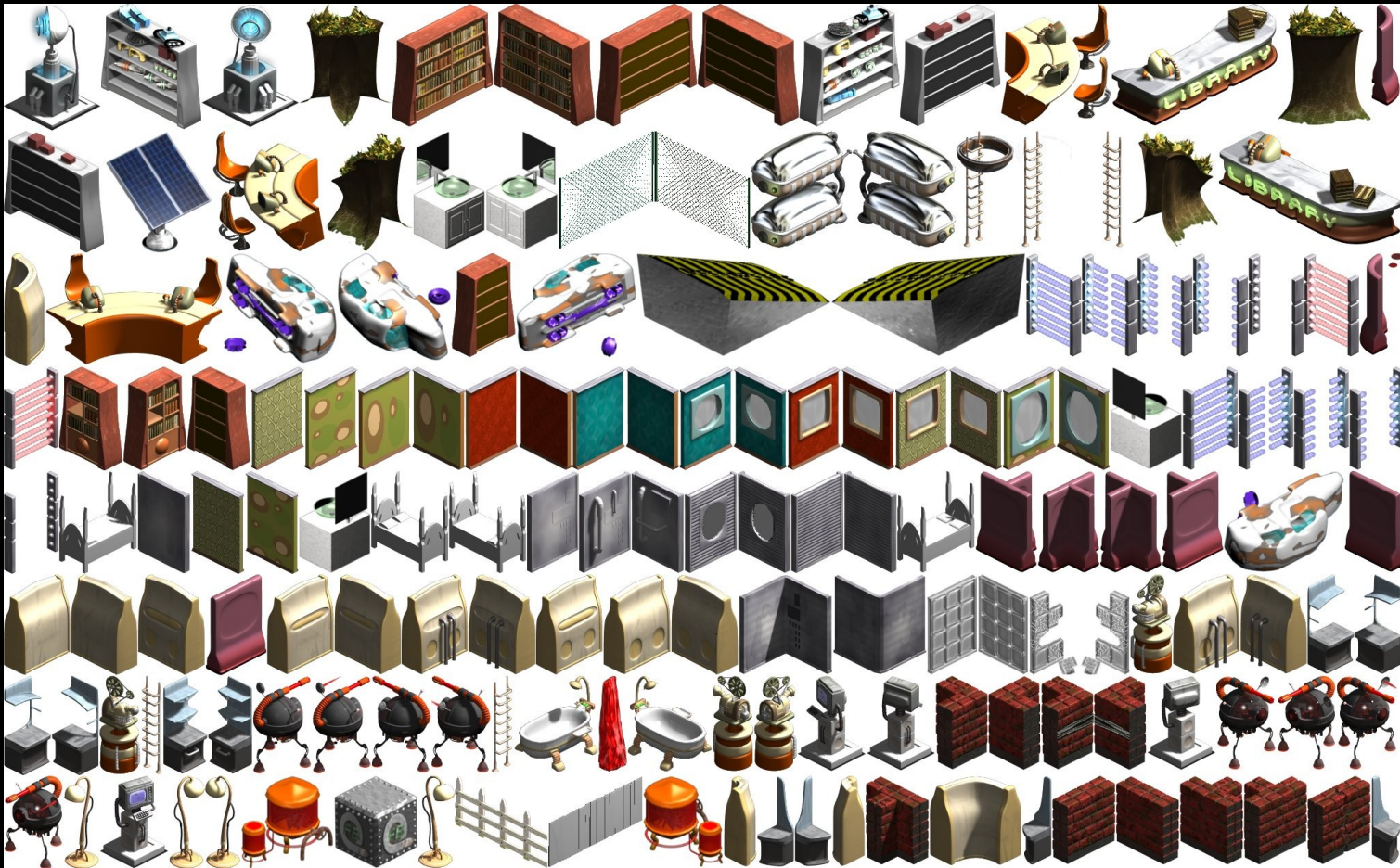


# FreedroidRPG modules



# Good design points

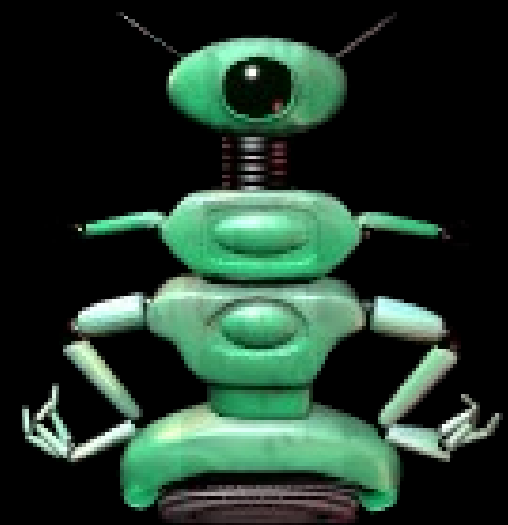
- Dual OpenGL et SDL support



# Good design points

- Dual OpenGL et SDL support
- Lua interface for scripts and dialogs

```
int lua_event_teleport_npc (lua_State *L)
int lua_event_display_big_message (lua_State *L)
int lua_event_display_console_message (lua_State *L)
int lua_event_enable_trigger (lua_State *L)
int lua_event_disable_trigger (lua_State *L)
int event_change_obstacle_type (const char *obslabel, int type)
int lua_event_change_obstacle (lua_State *L)
int lua_event_get_obstacle_type (lua_State *L)
int lua_event_delete_obstacle (lua_State *L)
int lua_change_obstacle_message (lua_State *L)
```



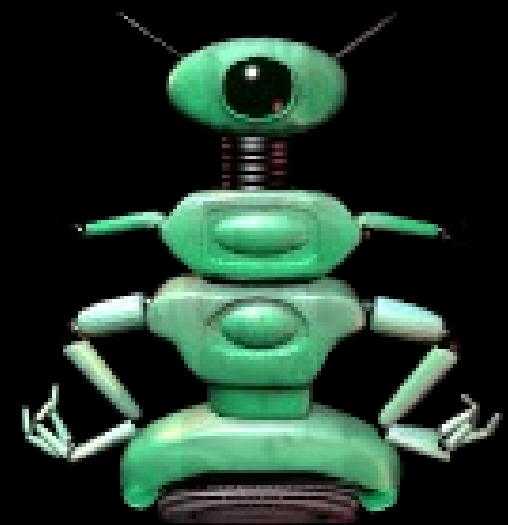
# Good design points

- Dual OpenGL et SDL support
- Lua interface for scripts and dialogs
- Easy internal savegame mechanism

```
struct my_struct {
    int a;
    float b;
    char c[SZ];
    ***
}

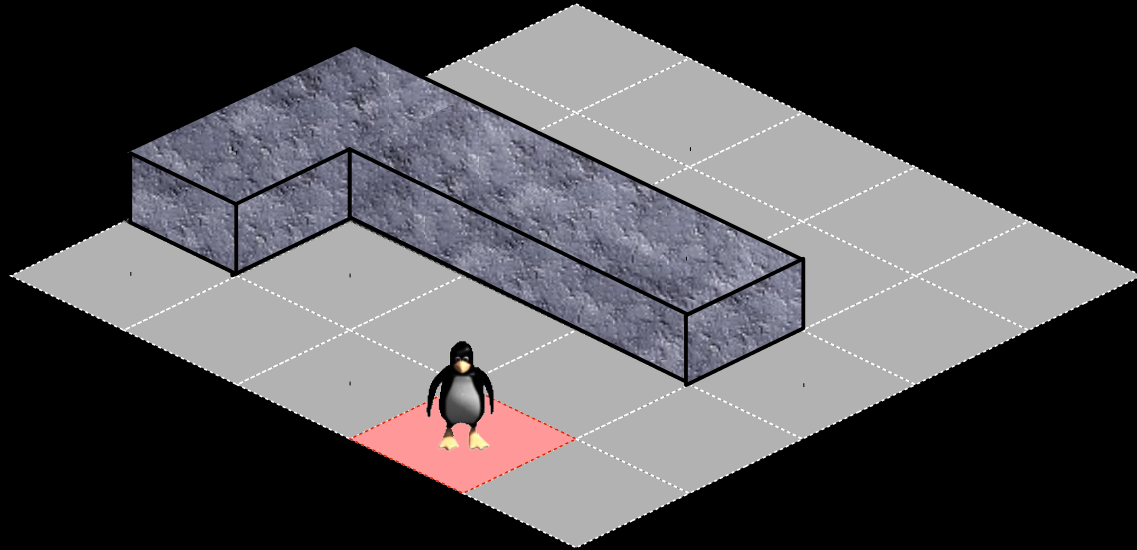
void read_my_struct(lua_State *L, struct my_struct *data)
{
    // Read "a"
    data->a = read_field(L, "a");
    // Read "b"
    data->b = read_field(L, "b");
    ***
}

void write_my_struct(struct auto_string *str, struct my_struct *data)
{
    // Save "a"
    save_field(str, data->a);
    ***
}
```



# Mistakes and problems

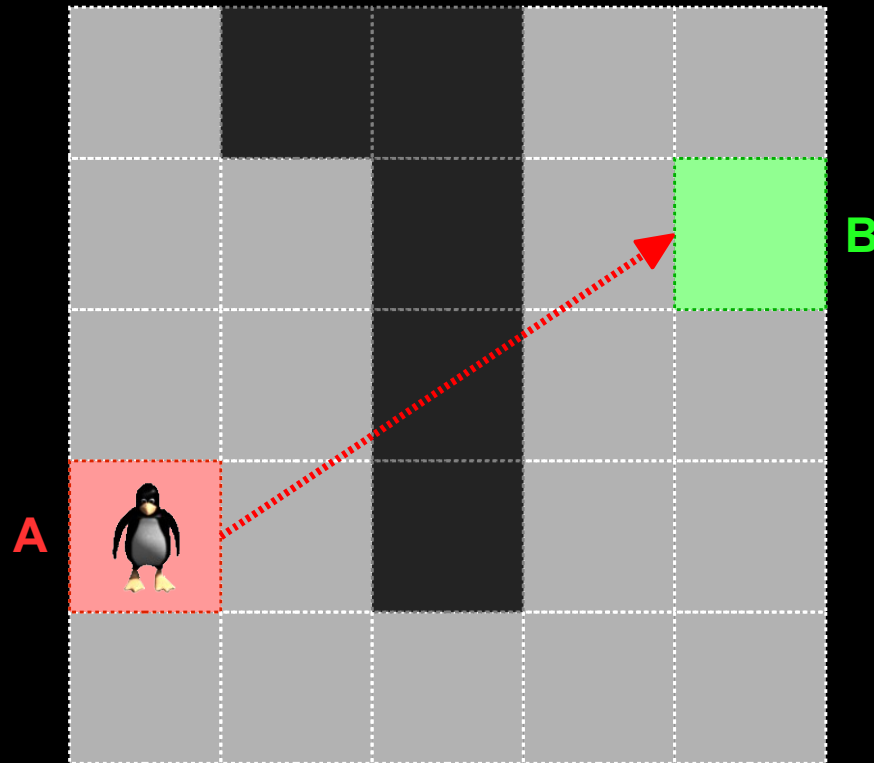
- Continuous coordinate system for obstacles





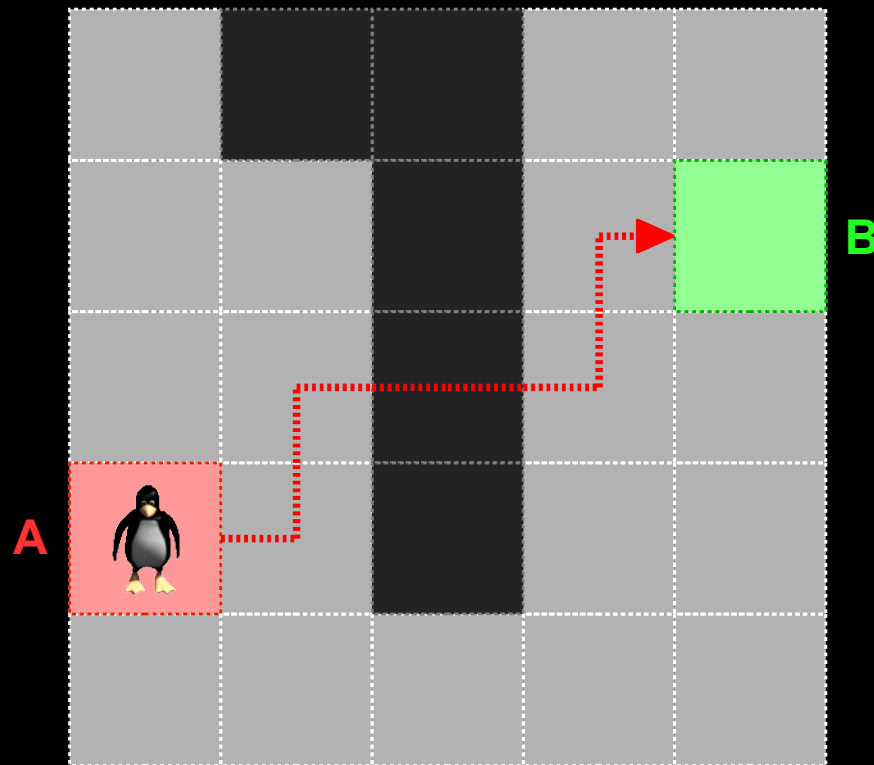
# Mistakes and problems

- Continuous coordinate system for obstacles



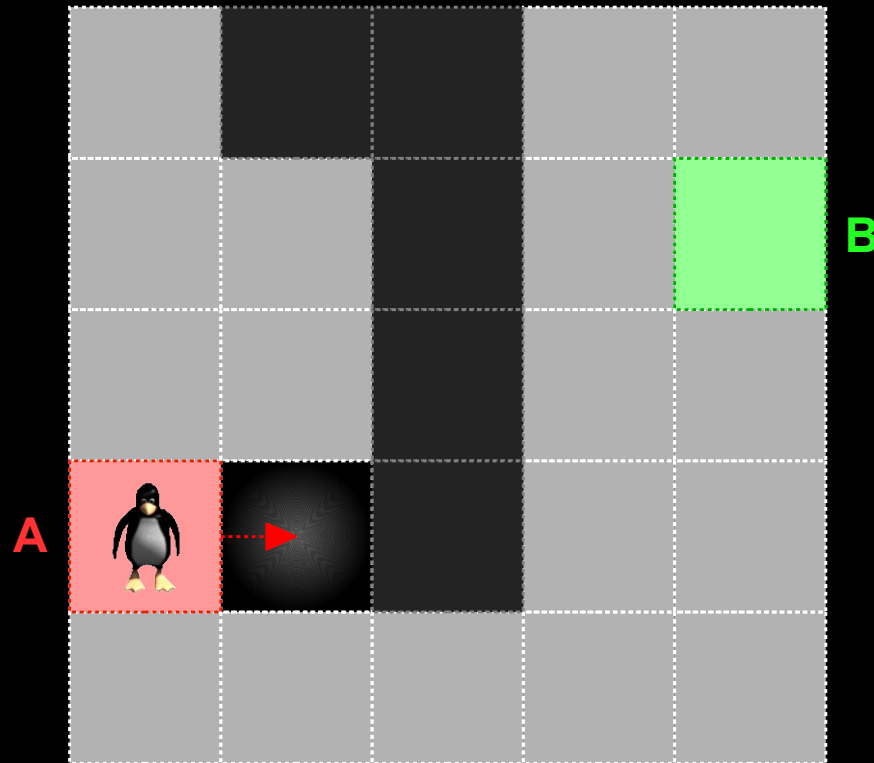
# Mistakes and problems

- Continuous coordinate system for obstacles



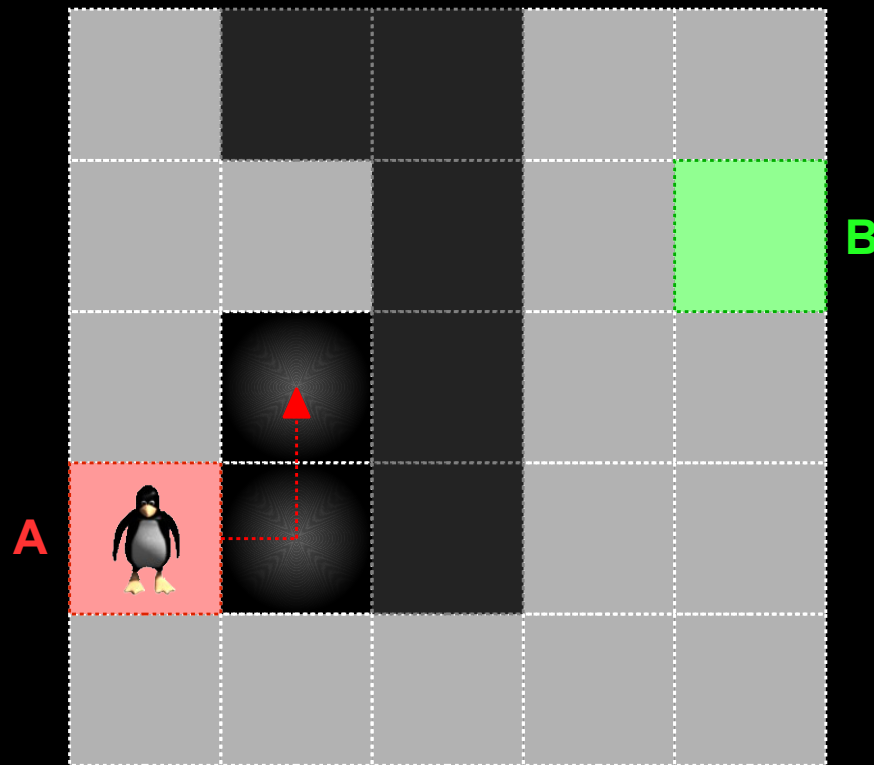
# Mistakes and problems

- Continuous coordinate system for obstacles



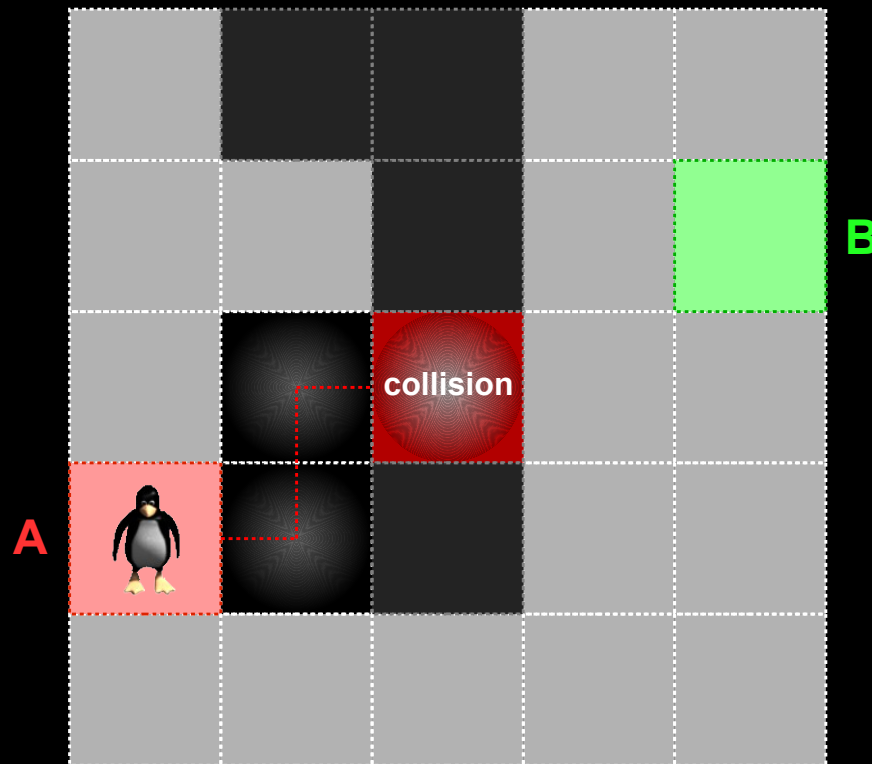
# Mistakes and problems

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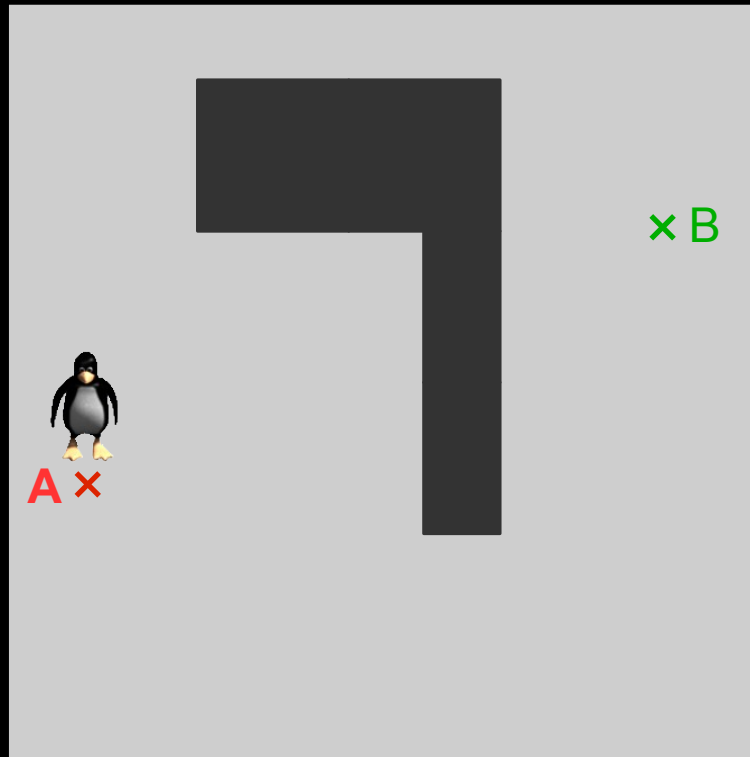
# Mistakes and problems

- Continuous coordinate system for obstacles



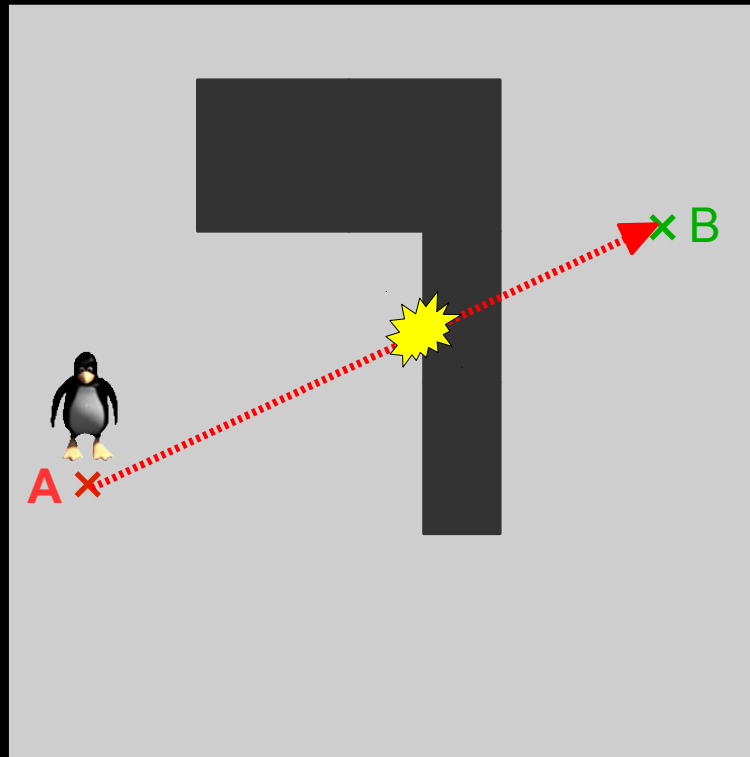
# Mistakes and problems

- Continuous coordinate system for obstacles



# Mistakes and problems

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# Mistakes and problems

- Continuous coordinate system for obstacles
- Lighting algorithm





# Mistakes and problems

- Continuous coordinate system for obstacles
- Lighting algorithm



# Mistakes and problems

- Continuous coordinate system for obstacles
- Lighting algorithm
- Very little automated testing

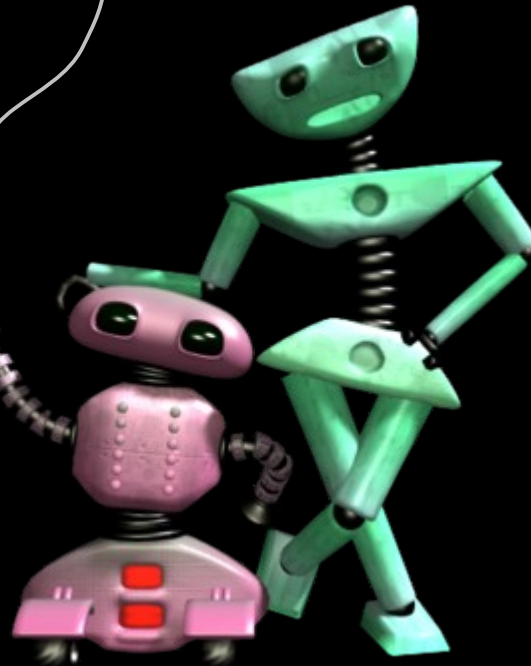


# Remaining questions

Translations

Savegame  
compatibility

Level editor





<http://www.freedroid.org/>

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