

Game Design Document

based on DOI: [10.1109/CGames.2012.6314556](https://doi.org/10.1109/CGames.2012.6314556)

Date: 29.05.2021

Name of the Game: D Headspace

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Tutorial: 2

Link to the game repository: <https://github.com/davinel000/d-headspace>

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1 Overview

D Headspace is a three-dimensional third-person action rpg with space fighting dynamics in an abstract thought process environment. Short game slogan: Survival and development through concentration. The goal of the game is to help the thought born in the mind of its owner to develop, to confront difficulties and Fears and to materialize in the allotted time.

For this, the player controls an abstract entity symbolizing an idea or thought that avoids confronting the Fears that haunt it, destroys obstacles in its path, and strives to survive and become stronger during a dramatically significant 21 days of practice for the average person.

The game is developed for the PC Windows platform using the Unity 3D development environment as part of the University of Bremen's Entertainment Computing course.

The game is intended for a single player and consists of chapters united by a common plot. It is designed in the abstract aesthetic of a minimalistic psychological (psychedelic) thriller: an environment in which absurdity and symbolism seek to evoke in the player vivid associations with real-life events and emotional experiences.

1.1 Game abstract

1.2 Objectives to be achieved by the game

The goal of the game is survival and development of the game character during the game's 21 game days (approximately 504 minutes). To win, the player must fight an outnumbered enemy, collect game resources, develop and complete in-game quests that open up opportunities to gain new abilities.

At the end of the 21 game day, the player gains access to the final quest, during which thought enters the battle for the right to be realized. Winning the final quest means a successful completion of the game.

1.3 Core gameplay

The character flies in a 3d space across a large-scale playing field, destroying and escaping from the pursuit of enemies, collecting game resources and applying skills and game items in duels and when completing game quests. The game dynamics change from quiet in the "daytime" to fast in the "nighttime" game period.

1.4 Game features

1.4.1 Genre

The game is a third-person action rpg in a three-dimensional, abstract space. The main character has a set of in-game characteristics (health, energy, speed, mass etc.). As you destroy enemies, collect game resources and complete game quests, the game character gains experience points and new levels. New levels give access to new skills and increased character characteristics. During the game the character interacts with NPCs, receiving quests from them. The player can use the inventory to accumulate and use in-game items.

1.4.2 Number of players

The game is designed for one player. The game has no competitive, cooperative elements or High Scores. All quests are done by the player.

1.4.3 Game theme

The game space is a minimalistic abstract world - the "inner space" of human consciousness, in which the laws of physics apply only partially, and in the form of clusters of game objects and NPCs, various inscriptions display the human thought process. At the same time, the game inherits elements of the space fighting game genre in terms of gameplay (high-speed flights and chases).

Minimalism and conventional images of game objects also refer to arcade casual games, to which the project gravitates in its game mechanics.

1.4.4 Story summary

We know little about D as a person, a bearer of thought (main character) in the game. This allows the player from some point to try to identify with this person. D has no gender, no nationality, it is a conventional designation for a person capable of thinking and experiencing intellectual and emotional difficulties in formulating, developing and implementing ideas.

The game immerses us in the Headspace of a person about whom the player knows nothing. In fact, wagering the scenario of one thought born in D's head is the player's attempt to allow the thought he or she has in his or her head to be born, survive, develop, and materialize.

In the process of creating a thought the player chooses from the proposed options-tips or their own options-thought formulation - this is the name of the thought, it is the same individual association with which the player will pass the game and experience. The task of the game is to dissolve the individual experiences of the player himself in the game dynamics of combat and the role component.

The game scenario seeks to recreate the experience of the emergence of a certain idea in the human mind, which goes through stages of development from creation through formulation, the beginning of active action (72 hours, according to Bodo Schaefer, the period in which to begin to implement the idea). The idea faces Fears and obstacles brought by the surrounding reality (feedback, circumstances) and the idea bearer's own doubts and experiences (overestimation or underestimation of own capabilities, doubts about originality).

The thought does not sleep, unlike its host, so in sleep it continues its travels in an altered space, where NPCs appear chaotically, the aesthetic components of the game mix and create a sense of the absurdity of what is happening.

After 21 days of practice, the main character has a chance to establish itself in a person's mind, which means that it has successfully passed its existence exam.

2 Mechanics

2.1 Game elements categories

Thought Bearer D.

This is an abstract character, whose consciousness is the game space. According to the actual game idea the character is not interactive, but the time of day (awake, asleep) and D's mood determine the characteristics of the game world (background color, weather phenomena)

Main Character (Thought, Idea)

The game's main character is represented as an abstract ball resembling a bolt of light or a comet - a glowing object with a tail which illuminates the night space. The main character is interactive, at the beginning of the game it is possible to choose the characteristics of the character based on an imaginary "psychological test". As the main character develops, he acquires new characteristics and grows in size. The character, moving through the game world, can destroy obstacles that arise on the way, rescue or fight with enemies - Fears. To pass the game successfully, the main character must master the use of concentration state. Concentration allows you to use special skills - destroying obstacles without damaging yourself, moving faster, etc. Gaining game experience allows the player to choose his preferred path of character development.

Fears (Enemy)

The main opponents in the game are Fears.

They are black ball-shaped objects surrounded on all sides by spikes. Fears pursue the main character, throw him off course, deprive him of HP and seek to destroy him. As they evolve, the Fears are modified and become more dangerous, such as gaining the ability to "stick" to the main character or "poison" him, adding to the damage to his life with lasting energy damage. They are able to pack up and attack in groups.

Like the main character, Fears have mass used to calculate in-game physics and damage inflicted, health points that determine their vitality, speed and acceleration, additional abilities (poison, group behavior), and the amount of experience points gained for destroying them. The level of Fears determines the general set of characteristics and depends on the in-game time, the quest chosen by the player and the level achieved by the main character.

Their destruction (destruction in combat or during a quest) brings the character' experience which can be used for development.

Fears often move faster than the main character, this requires evasion skills, as well as the ability to change direction quickly.

Constellations of Fears

Fears can combine into Constellations - in the form of objects that resemble real-life shapes (a window, a book, a weapon), as well as inscriptions (such as "I WON'T ACHIEVE IT"). This usually happens when spawning the Fears in quest mode. In this

situation Constellation is able to chase the player and the Fears themselves don't split up into separate objects until they're critically close to the player.

Distraction (Material)

Distractions are an inactive element of the game. They act as barriers, causing damage to the main character or the Fears crashing into them. Like Fears, they have mass and health characteristics and can be destroyed. When destroying Distractions the player gains some experience and also has a chance to drop an in-game item.

On occasion, Distractions act as NPCs and can initiate a quest or dialogue in a quest area or free play space.

Constellations of Distractions

Like Fears, Distractions can be linked together in Constellations in the form of real-world objects, designs, or writings. Interacting with such objects in quests (such as destroying the "DON'T EVEN" fragment in the Constellation "DON'T EVEN TRY") allows you to successfully complete such quests.

Spiral (Global Time)

The spiral acts as a non-interactive game object that allows the player to navigate through space. The end of the spiral is the end of the game.

Day and Night (local time)

Day and night are game states that determine the characteristics of the environment - lighting and NPC features (Distractions are stronger during the day, Fears move faster at night).

Concentration (state)

Concentration state is one of the key components that allow the main character to apply special skills to interact with in-game objects. It is the most frequently used element of the game. This state also reduces the damage caused by collision with surrounding objects.

Game Skills and Abilities

- Mental practices (analog of "magic"):
 - Speed of entering concentration mode;
 - Punch at a distance
 - Attracting Objects
 - Ability to see at a greater distance, better recognize enemies and quest areas
 - Slows down the game time
 - Restores energy points at a faster rate
- Flexibility (analog of dexterity):
 - Abrupt right, left, up, down movements to fly around obstacles without harming yourself
 - Barrel roll, which allows you to fly around and attack an enemy in pursuit from behind
 - the slalom trick for flying around obstacles in your path
 - A multiplier for the "acceleration" ability as you reach higher levels.
- Willpower (Counterpart to "Force")
 - Resistance to Poison
 - Mass Enhancement that increases damage dealt.
 - HP increment as subsequent levels are reached
 - Shield (Spends energy points instead of HP during hits)

In-game skills become available as the player completes certain quests, level up the character, and gain certain achievements.

In-game items

The player's inventory can contain two groups of items

- Activatable "potions" (activated at will of the player and affect the game world or character characteristics):
 - Abrupt accumulation of significant mass
 - Temporary invulnerability
 - Fearlessness (attacking enemies scatter to the sides)
 - HP regeneration
 - Energy points regeneration
- Intraquest keys (grant access to individual quests or intraquest items)

2.2 Rules

Main basic rules are listed below:

- To win the game, the player must complete all main storyline quests in a timely and consistent manner
- HP and energy points are limited
- The character gains experience as he destroys opponents and completes quests
- Player loses if his HP reaches zero
- The player loses if by a particular game stage (3 days, 21 days) does not perform a given set of quests
- The player loses if, in the course of the quest, he violates the conditions of its passage (destroys more elements that can not be destroyed)
- The player can use special abilities to change their characteristics and influence the world around them
- The player cannot leave the game area
- The player can leave the quest area before completing the quest, the quest does not stop, you can go back to complete it or interact with NPCs (chasing Fears) outside of the quest area.
- The Fears pursue the player as they are within a certain distance of the player
- The player must use them to successfully destroy enemies, complete quests, and activate special abilities
- Collisions with NPCs outside of concentration mode can damage both the player and the NPC
- NPCs can collide with and harm each other
- The player can activate individual quests only if previous quests have been completed (key)
- Time in the game runs regardless of the player's behavior
- As certain time stages are reached, new quests become available in the game area
- Quests are initiated after active consent of the player

2.2.1 Interaction rules

The collision of the player with a Distraction in the normal mode causes minor damage to both objects, taking into account the mass of both objects and the

mutual speed of movement. At the same time there is a deflection of the motion vector, taking into account the laws of physics (the objects are repelled from each other)

A collision of the player with a Distraction in Concentration mode leads to a similar result, at that the mass of the main character is considered to be increased by a coefficient, the damage dealt is considered to be decreased by a coefficient (special skills). The presence of the player's special abilities also applies in this interaction scenario.

Player's collision with a Distraction in the special ability application mode - the push causes damage with respect to Distraction in the amount of the damage value, caused by the player (mass, level, special ability application)

The player's collision with a Fear in the normal mode causes damage to the main character, taking into account the mass of both objects and the mutual speed of movement. The presence of Fear's special abilities affects the results of the interaction (poisoning - gradual reduction of the player's energy or life over a certain period). The presence of the player's special abilities also applies in this interaction scenario.

Collision of the player with a Fear in concentration mode causes reduced damage to the main character, taking into account the mass of both objects and the mutual speed of movement. The presence of special abilities is taken into account in the same way (for example, if the player has a shield turned on, energy points are deducted instead of life points).

Collision of the player with a Fear in the special ability mode - the push causes the Fear to be pushed away from the player at a distance determined by the character's level of development of this ability, as well as the corresponding damage with respect to the Fear.

Collision of Fear with Fear, Collision of Fear with Distraction, Distraction with Distraction: causes minor damage to both objects, taking into account the mass of both objects and the mutual speed of movement. At the same time there is a deflection of the motion vector, taking into account the laws of physics (objects are repelled from each other)

2.2.2 Artificial Intelligence

Fears: free state. In the free state, Fears move around the game space for a short distance in the spherical range, before they come into the player's field of vision.

Fears: Hibernate state. When in a sleep state, Fears do not move around the game space until the main character gets in close proximity to them, or until a trigger initiates their awakening.

Fears: Movable state. In the moving state, Fears chase the main character, seeking to touch him, developing the greatest speed. In some cases, Fears move faster than the main character in close but non-overlapping trajectories, resulting in "bullfighting" behavior, which allows the main character to avoid a collision and counterattack.

Constellation of Fears - shows signs of Fears asleep and moving, except that Fears revert to pack behavior if they are destroyed or need to overcome obstacles.

2.3 Game world elements

Spiral of time

The game space is "threaded" on a "spiral of time". The movement of the game space along the spiral is beyond the player's control. As the game moves in the spiral (1 turn - 1 day) new quests appear in the game, which become available to the player on condition of passing a part of the previous quests or game inventory items (keys).

Environmental effects

Such effects as rain, snow, thunderstorm, fog are visually displayed in the game environment, affecting the player's ability to navigate in space. During the dreaming period (night), environmental effects can occur unexpectedly.

Playing field boundary

The player is able to move through a large-scale playing field. It is chaotically scattered with NPCs and game resources. It is impossible to go beyond the playing field: as the first boundary is reached, the player's speed gradually slows down, reaching zero value, which aims to send the player backwards.

2.4 Game log elements

Number of Experience Points: determines the level available to the player and the ability to acquire new skills and upgrade characteristics when advancing to the next level

Player level: determines such characteristics as mass, HP limit, energy limit and composition of available Skills;

Game Time: determines at what point in the main storyline of the game the main character is

Save: determines the moment of the player on the playing field, a set of characteristics fixed for the player at that moment.

2.5 Other elements

2.6 Assets list

- Main Character
- Fears
- Distractions
- Game Inventory Items
- Weather Effects
- In-game collision model
- In-game skills table
- Constellations Model
- Quest Sequences

3 Dynamics

3.1 Game World

3.1.1 Game theme details

The game world is a space with limited visibility, the background and content of which depends on various game scenarios.

The guiding element of the game world and the background is the Spiral of Time, along which the game area advances and rotates. Each turn of the spiral is one day, where 1 hour of game time equals 2 real minutes. 24 minutes last one day, of which 16 minutes are daytime 8 minutes are nighttime

A special role in the game theme is played by weather phenomena, which symbolize the mood of the thought bearer. Clear weather, fog, rain and snow replace one another as time passes, symbolizing a balanced state, depression, search and doubt.

During the day the background corresponds to the color palette of the sky - from dark purple, through dawn red, orange, to daytime yellow and white, through sunset pink, lilac, to evening purple and nighttime black.

At night, the background is mostly black. However, as the thought bearer sleeps and dreams, unexpected weather phenomena and background color changes are possible.

New quests and game objects appear on the game area as it spirals through it.

3.1.2 Missions/levels/chapters Flow

The system of quests in the game is marked by the main stages of the development of a thought or idea in the human mind, and corresponds to the scenario of the game:

1. Welcoming the player (non-interactive stage).
2. Birth of a thought. Tutorial. Basic knowledge of moving and acquiring skills, interacting with the game world.
3. Formulation of an idea. Sculpture ("building") - destruction of a part of game objects for the resulting game object

4. "Getting to Work". Initiation of an idea (up to 72 hours = 3 days of playing time - must complete a series of game tasks)
5. Practice. Facing groups of Fears to overcome:
6. Underestimating of own abilities
7. Overestimation of own abilities
8. Fear of mistakes
9. Receiving negative feedback
10. Emotional burnout, dealing with overstrain
11. The final quest - the embodiment of the idea (a set of tasks and the main game boss - "constellation" from Fears, a fortress from Distractions).

3.2 Missions/levels/chapters elements

The scenario of each quest is determined by the prerequisites:

- the fact that previous quests have been completed
- the time of day and night
- availability of keys in the inventory
- the player's level (NPC's difficulty)

After entering his area the player must agree to proceed to the quest - this initiates a welcome inscription on the screen that the quest began.

On successful completion of the quest the player receives experience points and the quest completion inscription. On unsuccessful completion of the quest the player receives a corresponding inscription. The quest can be reinitiated the next day.

Generation of objects within the quest takes place relative to the player's location.

3.2.1 Objectives

Typology of the quest elements:

- destroy all distractions
- destroy the given part and leave all other distractions untouched
- survive for a certain period of time in a chase
- find the key in the volume of the distractions, move it to another playing area to escape the chase

3.2.2 Rewards

1. Collecting game crystals/resources gives the character experience points

2. Destroying NPCs gives you experience points
3. Completing each quest gives the character experience points
4. Destroying individual NPCs gives you potions or keys
5. Gaining enough experience points gives the player a new level
6. A new level gives the player the ability to choose a new skill, increases the HP and energy limit, taking into account the available skills (multipliers)
7. New skills add additional abilities or characteristics to the player character
8. Successful completion of individual quests gives the player character a new skill of the player's choice

3.2.3 Challenges

Non-combat challenge.

The player's task is to destroy all or individual Distractions. Intraquest Fears are not represented.

Mixed challenge.

The player's task is to destroy all or individual Distractions. In the course of the quest, Fears appear that must be destroyed or escaped from.

Duel with individual Fears or constellation of Fears

The player's task is to destroy or escape from the Fears

3.3 Special areas

Special zones and bonus levels are not provided in the game

3.4 Game interface

The game interface is represented by several main screens

Main menu (start a new game, continue from the last save, load the game, exit the game)

Menu options (sound settings, graphics)

Pause menu (enter options menu, exit to main menu, save or load the game)

The inventory menu (list of items in the inventory)

Menu of the skill tree and the acquisition of a new player level (a list of skills, if the level is increased - the ability to select an additional skill, increase the level of an existing skill or characteristic)

Download-save game menu (selection from a list of saved games, with the date and time of saving)

3.5 Controls interface

WS - move forward/backward

AD - strafe left-right

Hold Shift - move faster

Mouse move - move around

E - interact with an object

mouse Wheel - select a special ability

RMB - concentration

LMB - initiate special ability through concentration

F - inventory

Esc - menu

3.6 Game Balance

Main character:

Mass and size

HP, HP limit, HP regen

Energy, Energy limit, Energy regen

Speed, Acceleration

Damage

Distractions:

HP

Mass and size

Game objects chance

Fears:

HP, HP limit

Speed, Acceleration

Mass and size

Damage

Special ability chance

4 Visuals and Sounds

[This section details what the player sees and hears. This section can be extended in case of augmented reality games like the inclusion of smells].

4.1 Game visuals

The game includes a wide range of in-game visuals: plumes from the movement of the main character and Fears, flashes when hitting and destroying objects, weather phenomena, and a time spiral.

4.2 Game sounds

The main character and Fears make sounds as they move and accelerate. For Fears, this lets you know their presence and location relative to the main character. Collision with game objects, collecting game objects is also accompanied by sounds. The background music in the game changes depending on the time of day and weather. Weather phenomena can also accompany the gameplay with sounds (rain).

5 Document information

5.1 Definition, acronyms and abbreviations.

TBA in next revisions

Term or abbreviation	Definition and acronyms

5.2 Document references.

TBA in next revisions

6 Attachments

TBA in next revisions

7 Project plan

Start date	Deadline	Activity	Results
11.05.2021	25.05.2021	Game Concept and Paper prototype preparation and video recording	Game Concept description Video of a paper prototype
25.05.2021	01.06.2021	Setting up initial Game Design Document	<ul style="list-style-type: none">- GitHub repository created- GDD created- Game Development plan published
01.06.2021	15.06.2021	Developing game Updating GDD Arranging collision systems	<ul style="list-style-type: none">- GDD updated- Physics Assets chosen, installed, tested, updated- Player controls tested- Main player model and basic texture- NPC static models for testing purposes (+instancing)- 3d space for emulating fly mode and collisions- Destruction model tested and implemented- Player stats model tested and implemented- NPC stats model tested and implemented- Inventory system model tested and implemented- Quest made and tested
15.06.2021	22.06.2021	Arranging animations Updating GDD	<ul style="list-style-type: none">- Destruction animations chosen and implemented- Flying and special modes animations- GUI (stats, inventory, lives), HUD
22.06.2021	29.06.2021	Introducing game AI Updating GDD Creating inventory system and objects	<ul style="list-style-type: none">- Pursuit behaviour (pathfinder asset selection and testing)- Special items reaction behaviour ("Fearless")- Inventory meny- Inventory objects (at least 3)
29.06.2021	06.07.2021	Game Polishing Game Evaluation Updating GDD Quest creation	<ul style="list-style-type: none">- Quest mode behaviour- Quest level map- Free float map- Success/Failure conditions testing- Testing quest

06.07.2021	13.07.2021	Game Polishing Game Evaluation Updating GDD Game menu Sound effects	- Game menu logic creation - Game menu modes tested - Sound effects assets added
13.07.2021	20.07.2021	Balance testing	- Level-ups balanced - Difficulty tested and balanced
20.07.2021	27.07.2021	Game finalization and testing	Tested game with necessary scenes

8 Typical engine subsystems explanations in D Headspace:

Graphics

The graphical subsystem of the game involves referring to models loaded through the game's Assets. Camera position and settings determine the visual field. Lights, weather effects, and textures are included in Prefabs of Unity.

Collision and Physics

Collisions are handled through Rigid Body and Box Collider, determining the occurrence of consequences in the form of simulated physical interaction and impact on main character and NPC stats.

User Input/Output

The data entered by the player from the keyboard and mouse are used to navigate the game and interact with the simulation of physical interactions through scripts (effect on the acceleration of objects).