Little Sister's Big Adventure

J34.1

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Ontroduction

Little Sister's Big Adventure is a 2D physics puzzle game where the main character, Little Sister, is fed up with living in an underground exile and starts puzzling her way to the surface. To solve the puzzles, she unlocks special mental abilities that allow her to resize crates, levitate planks and change the density of objects.

Game Description

World / History

Once upon a time, far, far away, there was a small tribe living peacefully in a land called "Smallasia". They called themselves "WANDs" and each one of them had mental abilities that were induced by eating special food called Brainfood. Brainfood grew everywhere where sunshine and moonlight could reach the earth. Different kinds of Brainfood gave different abilities. Depending on the WAND and the sort of Brainfood eaten, some WANDs got the ability to shrink or enlarge, levitate or even to change the density of objects. But only very few possessed the mental capacity to focus on multiple abilities at the same time.

All WANDs did all day had to do with harvesting or eating Brainfood. They were living peacefully together, helping each other out and sharing their special foods equally.

But their life was soon to be changed. One of them, Victor the Tiny, who was later known as "He-who-ate-too-much-Brainfood", got unsatisfied with his life. He wanted to become bigger, have more power and stronger mental abilities than the others. He recruited an army of minions and they stole all the Brainfood from the storehouse. Having eaten all the Brainfood, they soon possessed abilities far more powerful than any WAND before them. A cruel empire was built, they named it "Giantia".

Victor the Tiny wanted to have all the Brainfood for himself to gain yet more power. That's why he banished all people, except for his minions, into an underground exile, where neither sunbeams nor the moonlight reached the earth. They were watched and oppressed by "Big Brothers", Victor's evil guards. No

Brainfood could grow in the darkness and only a few had weak, fading mental abilities. It was easy to keep them from escaping. Up until now...

This is the story of "Little Sister". She is a rebellious teenage girl fed up with everybody moping around, telling tales of the glorious days and doing nothing. She decides to escape the dark dungeons...

Characters

Little Sister (Player)

She is a rebellious girl that is tired of the lethargy of her people and is desperate to escape them. She starts out with the ability to resize objects.

Big Brothers (NPC guards)

They are the evil, arrogant minions of the dictator. All of them have mental abilities, since they have access to Brainfood.

WANDs (NPC allies)

The people that were banished into an underground exile will populate some parts of the levels and be part of the puzzles. They are cynical and not eager to help Little Sister. Only a few of them still have mental abilities.

Atmosphere

Little Sister's big adventure starts in an underground enclave where she is living with the remaining descendants of her people. The hope to overcome the oppressive Big Brothers and to life once again on the surface died a long time ago with the last WAND who actually had known another life than the present one. Everyday living in the earth is hard and hollow. Most WANDs just roll around, cursing at everything and everybody, showing not even the slightest sign of any vigor.

Our art design goal is to capture this anguish with dark/brown/green textures and a fitting soundtrack.

On the other hand, everything that is related to player and game mechanics

will be in bright and saturated colors (e.g. picking-up Brainfood, highlighting the selected object, menus ...) this will not only guide the attention of the player to the important game elements, but also contrast and loosen up the melancholic mood dominating the game world.



This is an example level draft for the first chapter. It encapsulates varies ideas we are having about the level designs. She can interact with boxes and planks but also with other WANDs. For example she would have to enlarge the yellow WAND in order for the red WAND to fall down.



Chapter One

In the first chapter Little Sister has to find her way to the earth surface. She starts without any mental ability but is soon to find a large portion of Brainfood that will give her the ability to resize objects.

To get to the surface she has to solve puzzles, that when completed, let her climb/go up. Of course, Big Brothers are watching her and are trying to hamper her. From time to time she finds small portion of Brainfood that were probably lost by Big Brothers, which give here additional temporal mental abilities. Her people are cynical and not very eager to support her. However, from time to time, as they are bored anyway, they help her.

Chapter Two

Full of hope and excitement Little Sister exits for the first time in her life the dark labyrinth and steps out onto the surface.

However, nothing is as described in the nostalgic tales told by the WANDs down in the exile. The sky is dark with smoke, the land dry and dead. Exhausted Big Brothers are rolling around cautiously, watching each other while self being kept under heavy surveillance. Victor the Tiny does not trust his minions. He does not even let them trust each other. His fear of being overthrown has even led him to block out the sun so that no unaccounted Brainfood can grow. He keeps his source of power under strict control in secret farms and stashes it in heavily guarded storehouses.

Disappointed and angry that the land does not look at all as she expected, Little Sister decides to eat as much Brainfood as possible to become bigger and more powerful than Victor the Tiny so that she can eventually bring him down and clear the sky from the smoke. The goal of this chapter is therefore to gain as much mental power as possible.

Chapter Three

After having raided several storehouses filled with Brainfood, Little Sister

is now big and powerful enough to take Victor the Tiny on. She puzzles her way through the palace until she corners Victor the Tiny in his bathroom. Being more powerful than him she can simply shrink him down to the size of a small Brainfood portion and flush him down the toilet to his own underground hell.

Having gotten rid of the evil oppressor Little Sister faces now a though decision:

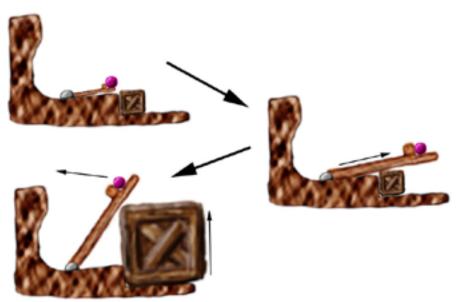
[Press A] Replace Victor the Tiny and become the new Big Sister of Giantia.

[**Press B**] Stay small, destroy the smoke machine and live a modest life as one of the many freed WANDs.

Puzzles

Little Sister is able to interact with various objects, such as boxes, planks, ladders, other WANDs (guards and her own people). These objects have a special appearance. In the beginning, she will only have the mental ability to resize objects, but to make the puzzles more interesting, she sometimes also needs to find Brainfood, that will give her additional mental abilities.

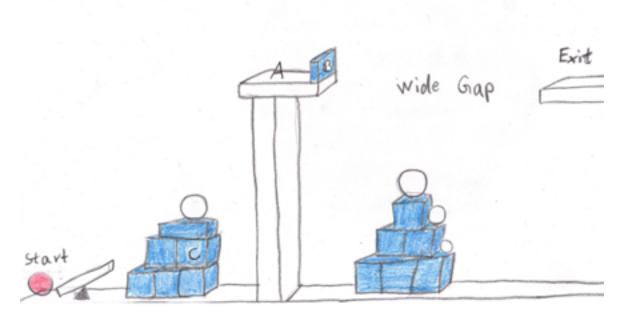
Each chapter consists of multiple puzzles that need to be solved to reach the exit.



This is an example of how the resizing will take place.

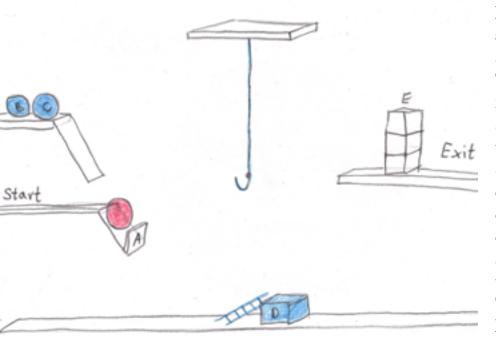
Resize-Puzzles

We describe some possibilities for puzzles, where she only has the resize ability. All these puzzles can be connected to form a chapter. Little Sister always needs to go from Start to Exit, as indicated in the images. She is illustrated by the pink sphere and all changeable objects are blue.



In the first puzzle, Little Sister needs to be catapulted to reach A. However, if she does not enlarge B first, she will fall into the wide gap. From there she has to create a stair out from the pyramid to get up again.

If she enlarges B, she will be catapulted against it and hence the plank will fall over the wide gap, letting her reach the exit. To get catapulted, she needs to resize C, so that the sphere can fall onto the catapult.

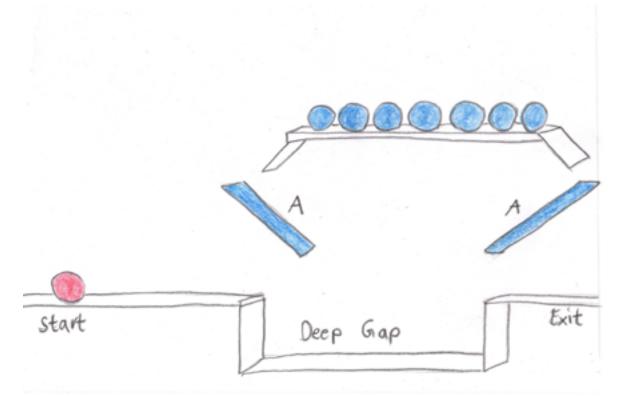


For this second idea, she needs the help of another sphere to push A away. For that, sphere B is maximized so that C rolls down.

Then she has to use the ladder to reach the exit. However, it is not possible to enlarge D that much to reach the exit.

She must make use of the rope that can change its size as well. By first elongating it, so that the ladder gets engaged with the rope, and then shrinking it again, she can build up the ladder.

To get over E, she needs the ladder to have the correct size. The boxes in E are not changeable.



To cross the deep gap, she needs the other spheres to roll down into the gap. To accomplish that, she can change the size of spheres, so that other spheres roll down and fill the gap. A also needs adjustement in the length. In the end it should be possible to roll/hop over the spheres.

Formal Elements

In Little Sister's Big Adventure, you will control Little Sister, who has to work herself through 2D levels, filled with puzzles. While the movement will be similar to classical jump and run games, the focus is mainly on the puzzles.

The goal of the game is to complete all levels by getting from the start to the end of the levels.

Players

The main focus is on the single-player campaign, where one player is facing puzzles and NPC opponents.

As an extra, a cooperative mode is under consideration, where two players have to work together to solve the puzzles.

Mental Abilities

Mental abilities give the player some variety in the interaction with objects in

a level:

Resize objects:

Little Sister can resize certain objects within the level. The objects have a maximum/minimum size and are only resizable in predefined steps.

Telekinesis:

Little Sister can lift and move objects, even heavy ones.

Change object density:

Little Sister can change the density of objects, making them lighter or heavier without changing their size.

Rewind time:

Little Sister can rewind time in order to avoid dead ends.

The ability to resize objects will be a permanent ability from the beginning. Other abilities can be obtained temporarily or strengthened by eating one of the small portions of Brainfood distributed within the levels. If the design of the puzzles demands the abilities to be permanent, the player will find a bigger portion of Brainfood, which will make the corresponding ability permanent.

The abilities will not work on fixed objects (e.g. the boundaries of the level) and on the player himself. Also, only objects within a certain distance from the player can be affected.

Enomios

The enemies in the game, i.e. the guards called Big Brothers, will be part of puzzles as well. They will use their mental abilities to disturb Little Sister, e.g. by increasing her size such that she can't move through certain parts of the level any more, or by moving objects while she is solving a puzzle. In order to beat the guards, Little Sister will have to move them outside of the range of the effected object or convince them to stop or undo some effect, e.g. by jumping on them.

Presliminary Gamepad Button Assignment

[START] Pauses the game and shows the menu.

[BACK] Pauses the game and shows a picture explaining the functions of the gamepad buttons / game rules.

[Left Joystick] Move left/right

[A] Jump

[B] Rewind time

[D-pad] Select mental ability

[LT], [RT], [X], [Y] Functionality based on selected mental ability

[LB], [LR] Switch through all elements that can be manipulated

Assignment for mental abilities

[Time reversing]

• [B] The player and all objects are moved back on their trajectory.

[Resizing] Resizable objects have 10 different sizes

- [LB/RB] increases/decreases the size one step
- [X] Maximizes the object (jump directly to the largest shape).
- [Y] Minimizes the object

[Telekinesis]

- [LB/RB] increases/decreases the levitation of the object
- [**Right Joystick**] moves the object left/right

Assessment

The main strength of our game are the physics puzzles that not only use basic rigid body dynamics but also resizable objects. The appealing background

story motivates the player to overcome the challenges and to explore the game mechanics.

Our target audience will be single-player physics puzzle game fans that enjoy a comic game and a mock-heroic story line.

Technical Aspects

Software / Class Design

Besides the obvious choices to program in C# with XNA 4.0 and Visual Studio 2010, we will model our objects in Maya.

We will use the Farseer physics engine, which is a well-maintained 2D physics engine using XNA.

From the software design perspective, it will be important that we achieve a clean coupling of the physics engine and the 3D engine. We also have to take care not to hinder the implementation of a scripting system, which is one of our high targets.

Graphics

Our basic game graphics will use regular 3D graphics with textures and shadows implemented with a shadow map.

At a later stage, we will program a particle system to improve the graphical appearance and also consider bump mapping.

Interface/Controller

The game will start with a menu screen, where the player can select levels. Between levels, there will be a primarily text-based story screens that tells the story before or between levels.

Within the game itself, there will be a help screen that shows the controls and the goals of the level. The player can switch to this screen by pressing a specific button.

While playing a level, there will be a small GUI that shows the currently selected mental ability and its strength.

Artwork/Modeling

Character models consist of a basic sphere-shaped 3D grid and a texture.

For the level and all level objects, we need 3D models, textures and a 2D projection of the 3D model, which will be used to compute the game physics. Possible level objects are crates, planks and chairs.

The background will consist of a simple image adapted to the setting of the level. At a later stage, we would also like to include a foreground image that enhances the richness of detail.

Sound

Background music Sound effects

Physics

A physics simulation is crucial to our gameplay. The Farseer physics engine will be responsible for the rigid body dynamics.

Later on, we would like to include simple particle effects to enhance the graphical appearance. A water simulation using a height map is also part of our "Extras" schedule.

Animation

Facial animation (eyebrows, eyes, mouth)

Animated foreground texture (weed, plants)

Game AD

Scripted enemies and environment

NPCs can use special abilities (basic AI)



Task	Who?	Time	Due date		
Pre-work tasks					
Final draft for project pro-	All	1 day	March 15		
posal					
Physical prototype + re-	All	2 days	March 21		
port					
Research	All	1 day	March 14		
- XNA					
- Farseer					
- Software installations/					
Xbox development					
- Maya					
- Visual Studio 2010					
Project setup	Christian/All	0.5 days	March 21		
Concept for 1st level on	Marina/All	0.5 days	March 21		
paper					
Basic Software design	Fabian/All	1 day	March 21		
Extended Software design	Fabian/All	1 day	March 28		
Functional minimum					

Functional minimum

One playable level with full physics support, resize ability and no story. No textures, no shadows, simple shader, no animations.

Controller input	Fabian	0.5 day	April 4
Graphics	Christian	2 days	April 4
- camera setup			
- simple shader			
Level objects modeling	Marina	0.5 days	April 4
(crates, planks,)			
Level modeling	Marina	1 day	April 4
Loading content	Marina	1 day	April 4
Physics engine integration	Fabian	2 days	March 28
- rigid body dynamics			
- resizing shapes		1 day	April 4
Physical properties for ob-	Fabian/All	1 day	April 4
jects			

Game logic - pick up Brainfood - unlock resize ability - select objects + high- lighting	Christian	2 days	April 4			
Low target						
3 playable levels (one for each chapter) with the basic storyline, back- ground textures, object textures, start/story screens, help screen (con- trols, goals of game), no additional mental abilities						
Interim report + presenta- tion	All	1 day	April 11			
Extended camera model (follows player)	Christian	0.5 days	April 18			
2 level concepts on paper	All	1 day	April 11			
Create background texture	Christian	1 day	April 11			
Include background texture	Fabian	1 day	April 11			
Create object textures	Marina	1 day	April 18			
Include object textures	Christian	1 day	April 18			
Level 2 modeling	Fabian	1 day	April 18			
Level 3 modeling	Christian	1 day	April 18			
Start/menu screen	Marina	1 day	April 18			
Help screen - Picture of controls	Marina	1 day	April 18			
Simple story screen - Screenwriting - Closed by clicking [A]	Fabian	0.5 days	April 18			
Background music	Fabian	1 day	April 18			
Desirable target						
Foreground textures						
Character textures						
More level concepts						
Time reversal ability						
Telekinesis ability						
Shadows/light sources						
GUI						

Balancing		
Character animation		
Advanced object highlight-		
ing		
Sound effects		
Souria circets		
High target		
Corinting system		
Scripting system		
Enemies		
Particles		
Thought bubbles		
Logo		
Extras		
Multiplayer		
Water simulation using		
height map		
Bump mapping		
More abilities		