Action-packed space battles... ...with just the right amount of chaos!

Development Notebook

ETHZ Game Programming Lab 2012

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1 Formal Game Proposal

1.1 Game Description

Overview

"Space Trouble!" is an action-packed space shooter where up to four players navigate their ships trough the gravitation fields of a 2.5D solar system, battling each other. The whole thing is spiced up with destructible planets and special items providing interesting abilities, as well as deadly weaponry.

General Requirements and Design Decisions

- As a party game, every action shall be **easy to understand**. Ideally, our game should be easy to learn and hard to master, although with a clear main focus on the former. An important point towards reaching this goal will be to find a proper balance between chaotic and strategic gameplay elements.

- We state that the games you play with your friends are most fun if the **challenge comes from the person next to you**. Of course we want the players to play the game again. This is well accomplished by generating a "next time I will beat you" or "let's gang up on him next time" atmosphere.
  This requirement also facilitates the development process: Challenging the players through well-balanced level designs or complicated Artificial Intelligence might easily go beyond our abilities and time budget, and may be disappointing for skilled players while being too hard for people only playing occasionally. In our game, we can easily meet this requirement by design.

- The game shall be **fast, chaotic, colorful and exciting**. The individual play rounds shall not take too long. For a party game, where many people might wait for their turn to play, it is crucial to define a round-based gameplay which allows for frequent switching. The players should not need a long introduction of how to control or win the game.

- The game shall be **fun for both the winner and the losers**, or in other words: Playing the game shall be fun enough that winning becomes secondary.

- We define a **simple ground idea which is fun by itself,** mixed with high speeds and chaotic settings as well as interesting and challenging additions like gravity effects and extras. With this, we can precisely control the challenge the game poses to the players, and with it, the players' experience.
This makes our development clearer and more modular, in the end helping us to successfully finish this project.

- The **influence of gravity, nice graphical effects, destructible environments** and many **easy-to-use items** shall set our game apart from usual space shooters and multiplayer last-one-standing games. By foregoing the additional degree of freedom a 3D game would give, we open the door for casual players. By carefully designing visual effects, we aim to reach a wide range of people having fun with our game.

Gameplay Elements

The World

Each of up to four players controls his space ship in a 2.5-dimensional world containing multiple randomly placed planets and similar celestial bodies. Each of them exposes gravity effects to its surrounding, manipulating the movement of other objects. Planets may be damaged and destroyed by player weapons such as rockets. Bombs attracted by a planet can easily blow a huge hole in its surface. Explosions can break off debris from the planet, which in turn can damage space ships or planets they hit and possess their own centres of gravity. The whole setting is constructed such that some planets are not much bigger than the space ships themselves.

The Players

Each player can control his/her ship freely, as long as the influence of gravity, damage on your ship and your opponents permit it. The players ship has a limited base arsenal of weapons and abilities which can be extended by collecting items on the map.

This base arsenal may include:
- A simple laser front gun whose shots are not affected by gravity.
- A shield for active defense: It is only active while the player presses a button. Activating the shield will protect the ship against almost everything, but at the same time it has a limited charge that depletes fast and recharges only slowly. This requires the player to use the shield strategically.
- Simple rockets that do more damage but are affected by gravity.

Play Modes / Goals

- Last Man Standing: Send your opponents to space-ship heaven while they try to do the same thing with you. There is a fixed number of respawns (possibly zero).
- Combine the relic: Collect all shards of a relic to win the game. Destroying a player will free all shards collected by him and the destroyed player will respawn after a short time.

Items & Weapons

Unlabeled boxes randomly appear in the world. From there they will fall towards the nearest center of gravity. At any time they can be collected by player ships, providing new weapons and abilities:

- Dimensional jump: The player jump performs a sudden jump to a position further ahead, ignoring any collisions on it's way.

- Big, Bad Laser: A weapon that needs to be charged. When released a bright ray destroys everything on its way.
- Homing rockets: Follow the nearest opponent but have limited fuel.
- Bombs / Mines: Affected by gravity, large scale explosions that also affect planets.
- Cluster rockets: First press fires a rocket, second press splits them into many clusters, third press detonates the clusters.
- Black Holes: Artificial centers of strong gravity. Destroy stuff that reaches their center.
- Repair packs: Refill the players health.
- Gun Turrets: Gun turrets are dropped like bombs and fall towards the nearest planet. There they assemble themselves and begin supporting the player.
- Main gun upgrade: Temporarily improves your simple laser gun. This may increase projectile speed, rate of fire, spread or other properties.

Various
- It might be necessary / useful to have fine particles (star dust) that indicate the local gravity fields.

1.2 "Big Idea" Bullseye

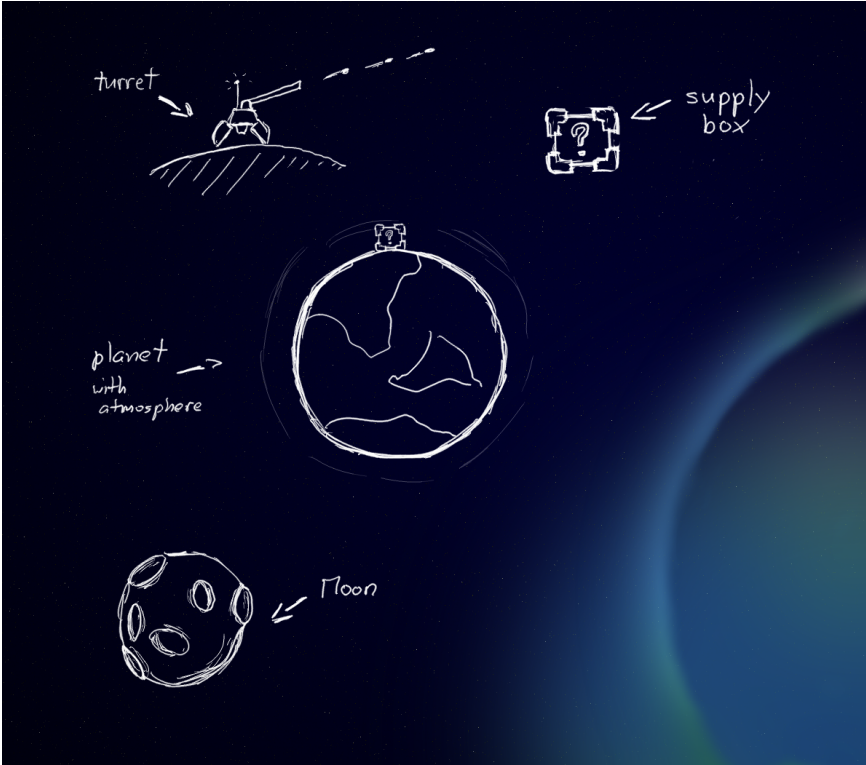*see title page*

1.3   Sketches & Artwork

Fig. 1.1: Two example planets, supply box prototype and an autonomous turret on a planet's surface.
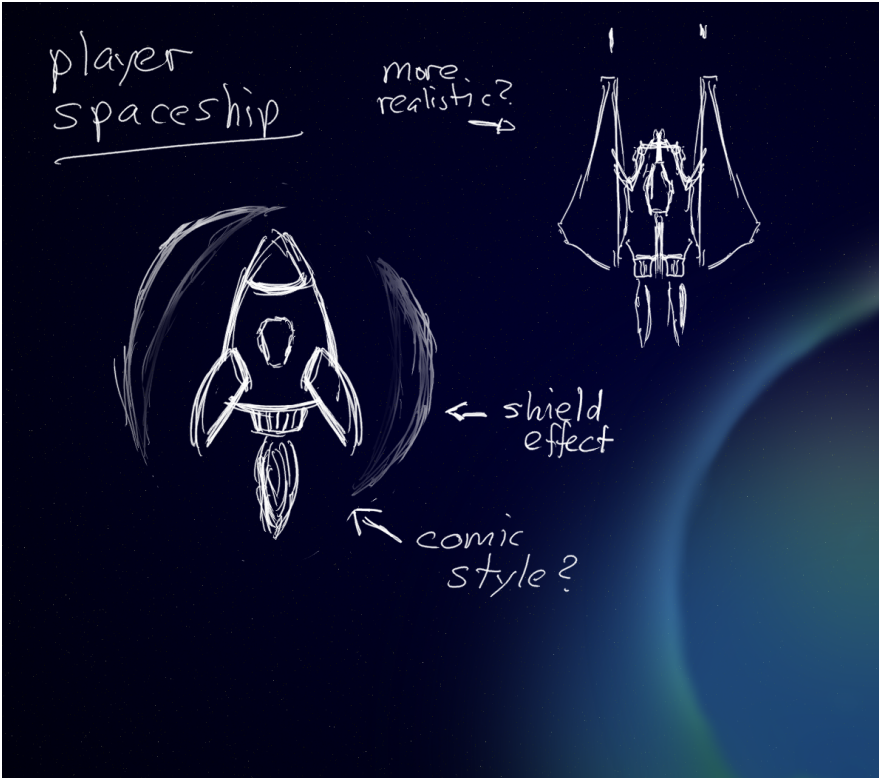

Fig 1.2: Two completely different space ship designs. One more realistic, the other comic-style
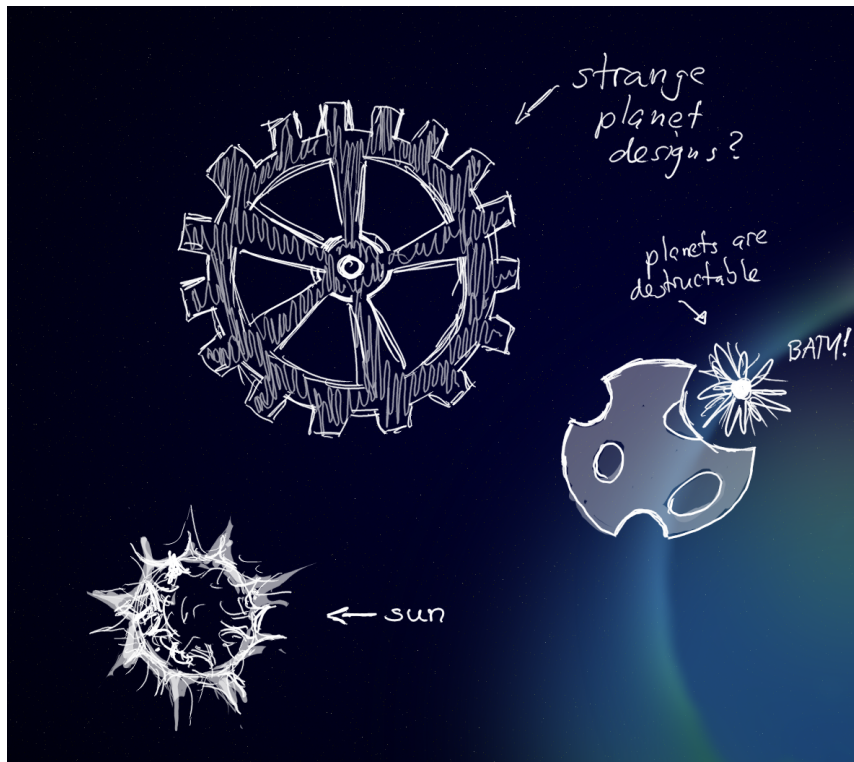
Fig 1.3: Variants for planet design and planet destructibility explained.

Fig 1.4: Sketch of a gameplay situation with various mechanics annotated.

1.4　Development Schedule

Preparation tasks

Task	associated people	time effort
Project Setup		
Study of existing physics engines		
Xbox360 Setup		
Visual Studio & XNA Setup		

Functional minimum

Task	associated people	time effort
Gravity engine		
User Controls		
Camera engine		
Laser Gun & Rockets		
Placeholder graphics		
Hard-coded map		

Low target

Task	associated people	time effort
Destructible planets		
Random map generation		
Visual backdrop		
Active Shield System		
Game menu		
Item system & few items		
UI with health bars etc.		

Desirable target

Task	associated people	time effort
Particle effects		
Advanced shaders/lighting		
Basic sound effects		
Improved user controls		
More items		

High target

Task	associated people	time effort
High quality 3D models and 2D sprites		
Fancy shaders		
Large set of items		
Advanced sound effects		
Background music		
Consistent art style		

Extras

Task	associated people	time effort
Multiple themed sets of planet art		
Non-player AI ships		
Map editor		

1.6   Timeline

Week 08		Idea brainstorming
Week 09		Concept art creation
Week 10	**Game Idea Pitch Proposal Draft**	

Week 11		
Week 12	**Formal Propsal Physical Prototype**	Preparation tasks
Week 13		
Week 14	**First playable demo**	Functional minimum
Week 15		
Week 16	**Interim demos**	Low target
Week 17		
Week 18		
Week 19	**Alpha release**	Desirable target
Week 20		
Week 21	**Playtest student presentation**	High target
Week 22	**Final public presentations**	
an on...		Extras

1.7   Tools and Technologies

- XNA
- Microsoft Visual Studio
- C# .NET
- Xbox 360
- Mercurial

- GIMP
- Blender
- Pixologic Sculptris