LimboNuauts

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Goals

- 2D Platformer Game

http://vjarmy.com/wp-content/uploads/2012/12/awesomenauts.jpg

- Fully Destructible Terrain

http://www.androidcentral.com/sites/androidcentral.com/files/articleimage/108579/2011/01/thumb_550_WRMS-AND_EN_800x480_Screen01_R2.png

General Outline

Coding

- Unity
- Multiplayer Basics
- Example Synchronization Issues
- The “Explosion” Pipeline

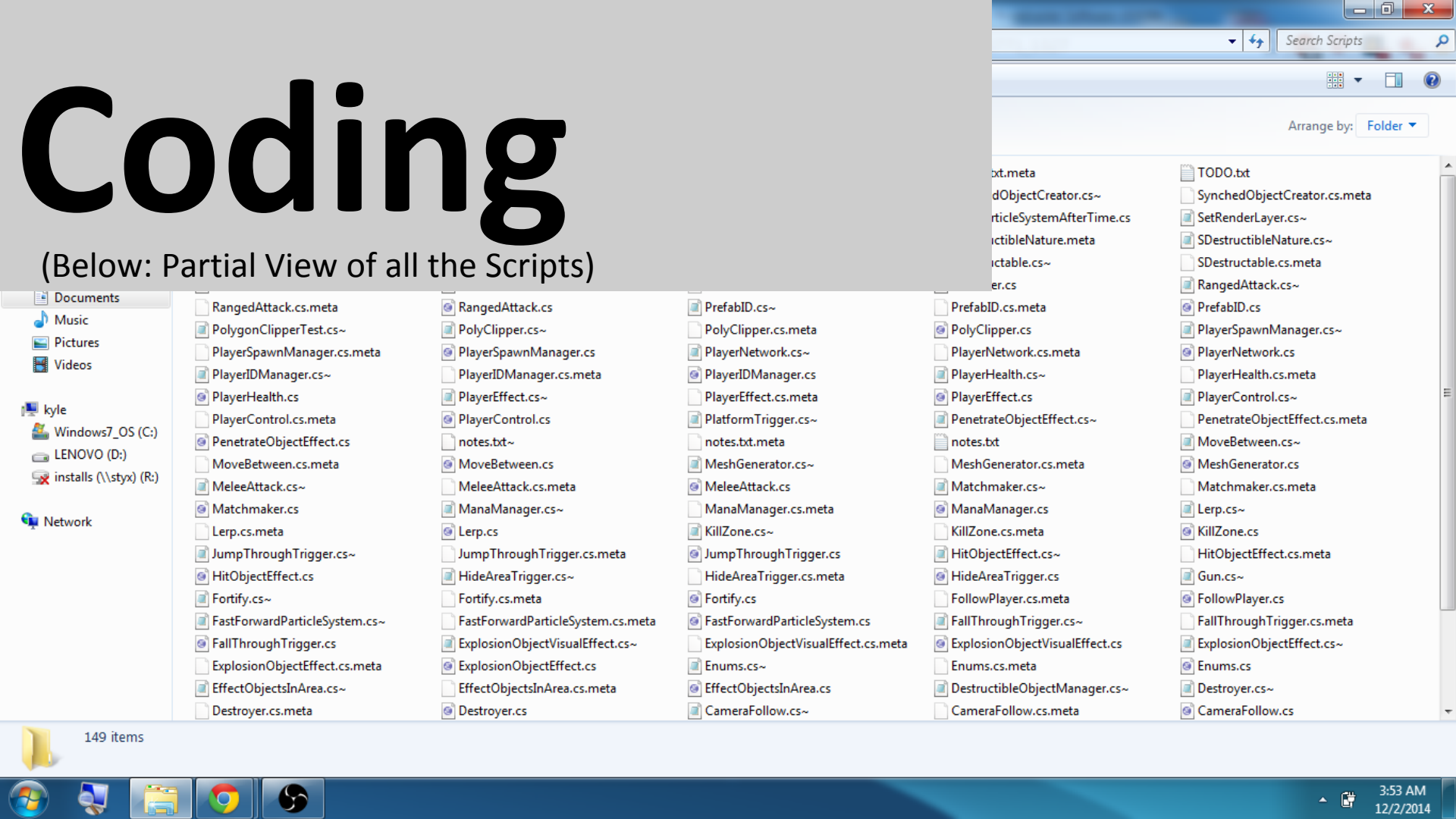
Art

- Artistic Direction
- Particle FX

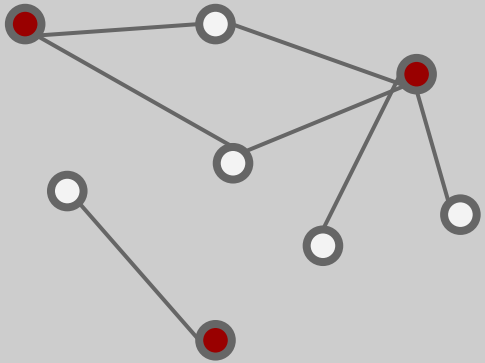
- DEMO

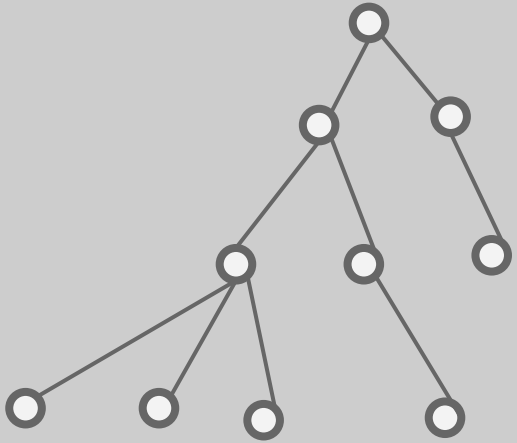
Coding

(Below: Partial View of all the Scripts)



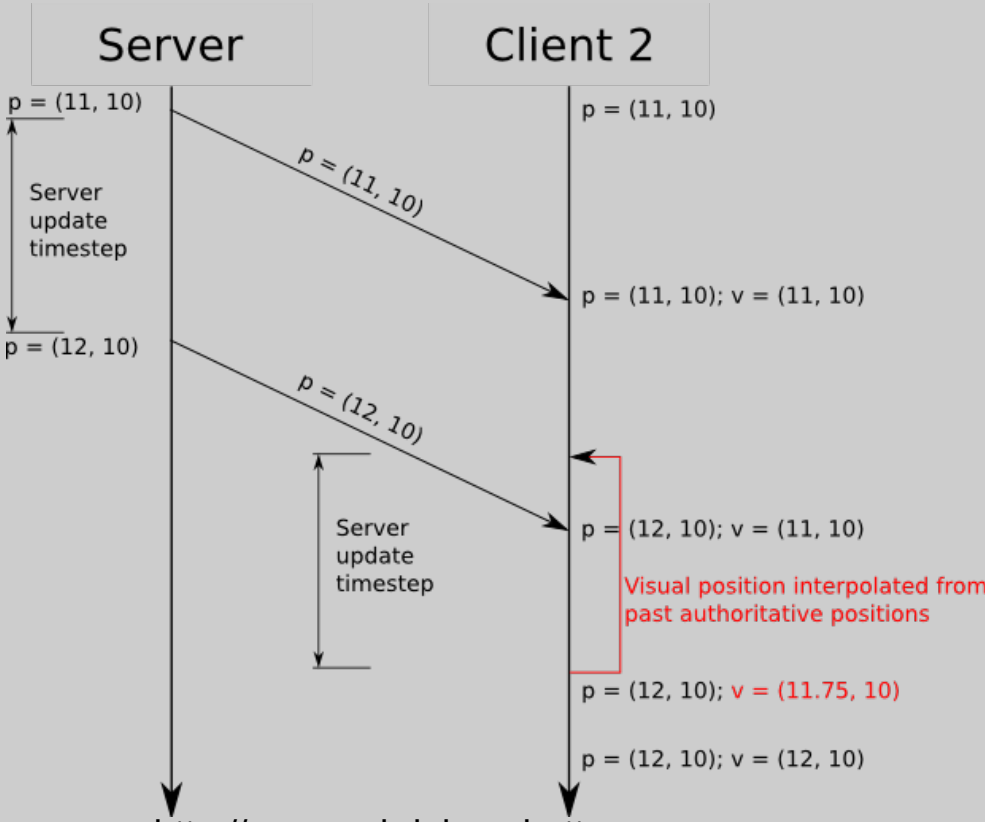
- Component Based Approach





Multiplayer Basics

- Synchronization is expensive
- Game states off by 100 ms



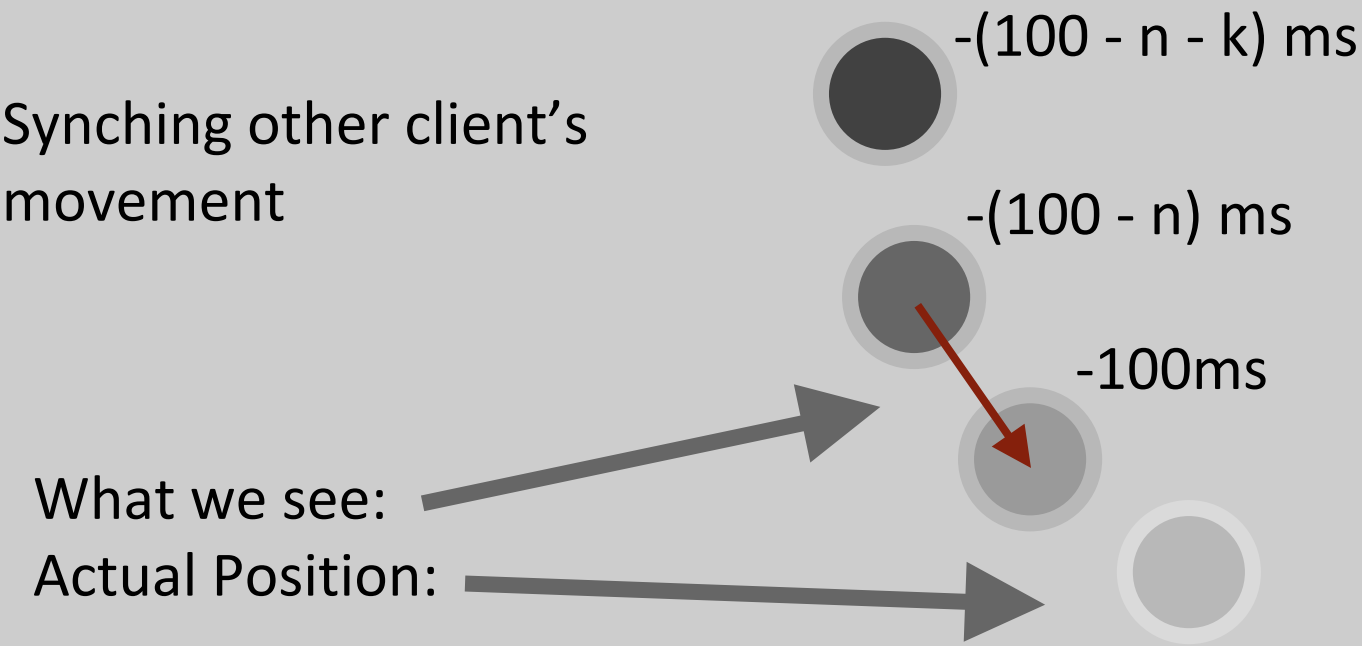
http://www.gabrielgambetta.com/fpm3.html

Implementing Multiplayer

- Library for connecting players
- PhotonView: fixed step state sychronization
- RPC: remote method call

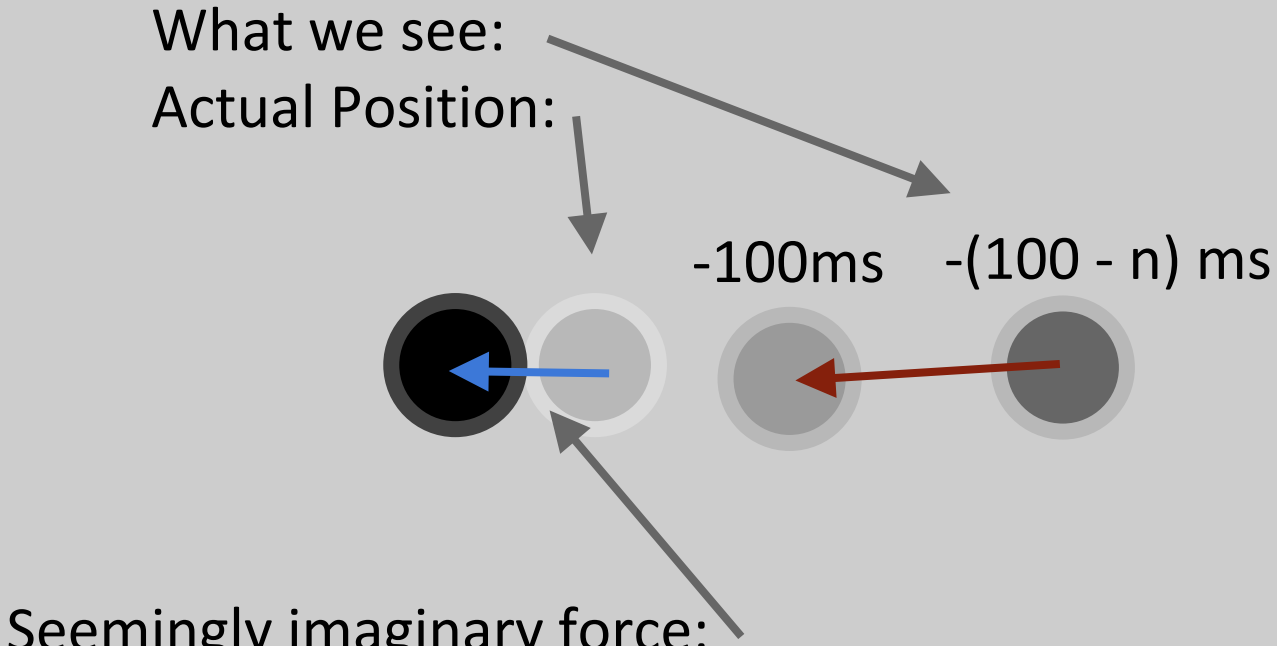
Multiplayer Physics (Positions)

- Synching other client's movement



Multiplayer Physics (Positions)

- Downside: glitched player to player physics



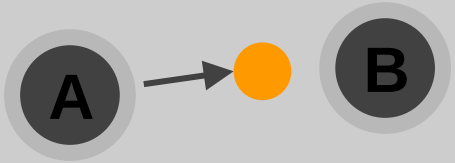
Multiplayer Physics (Projectiles)

- Projectiles: common time driven projectile created across clients
  - Avoids manual position synchronization

Position = F(PhotonNetwork.time - timeCreated)

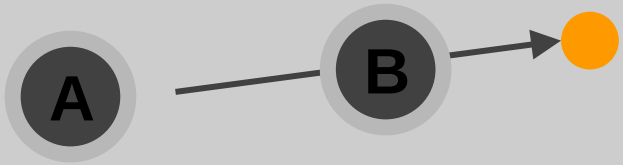
Multiplayer Physics (Projectiles)

- Spawn Tunneling: lag causes projectile to spawn past player in other client



Client A shoots at Client B at time T

(ClientA's View)

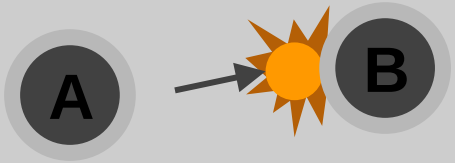


~ 100ms sync delay, Client B creates projectile at
time T + 100 ms

(ClientB's View)

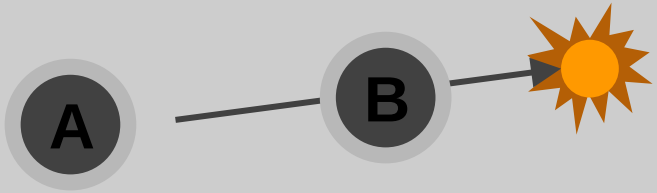
Multiplayer Physics (Projectiles)

- View Discrepancy : fix by setting 100 ms creation delay



(ClientB's View)

Client B registers collision, transmits event to Client A



(ClientA's View)

~ 100ms sync delay, event reaches Client A after projectile has passed

Multiplayer Physics (Projectile Effects)

- Projectile Effect: blind, slow, knockback, damage:
  - Wide variety of effects but limited network bandwidth

Solution: minimize calls, rely on previous shared info

(ClientA's View)

(ClientB's View)

Multiplayer Physics (Destructible Terrain)

- STATIC: avoid additional issues with position sync
- Special “Explosion” ProjectileEffect

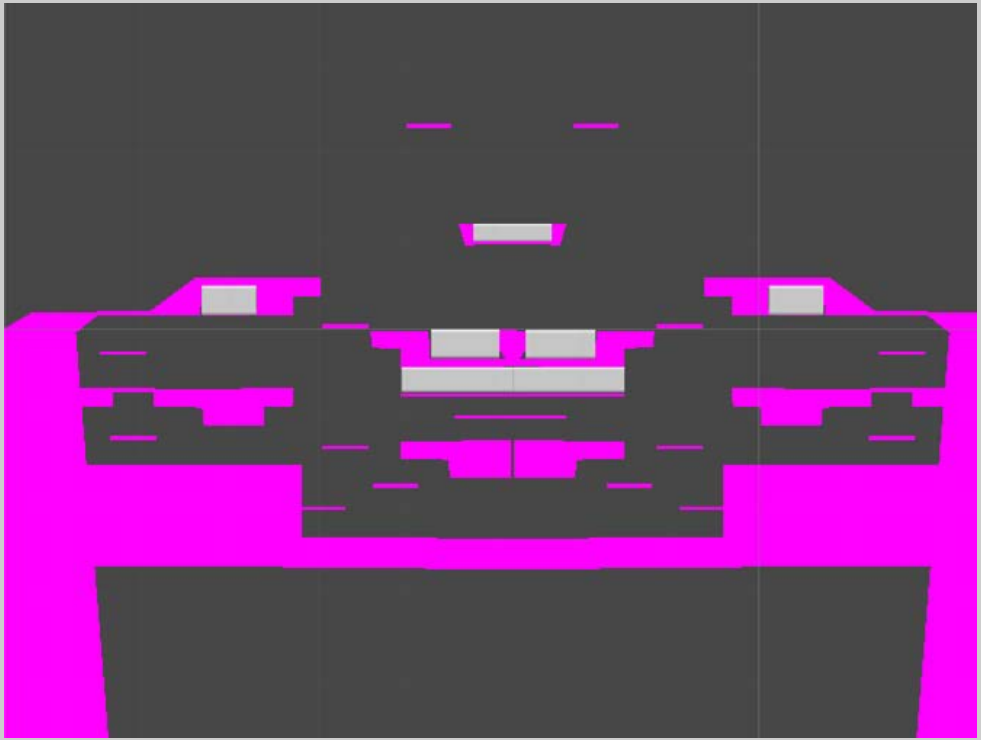
(ClientA’s View)

(ClientB’s View)

Art

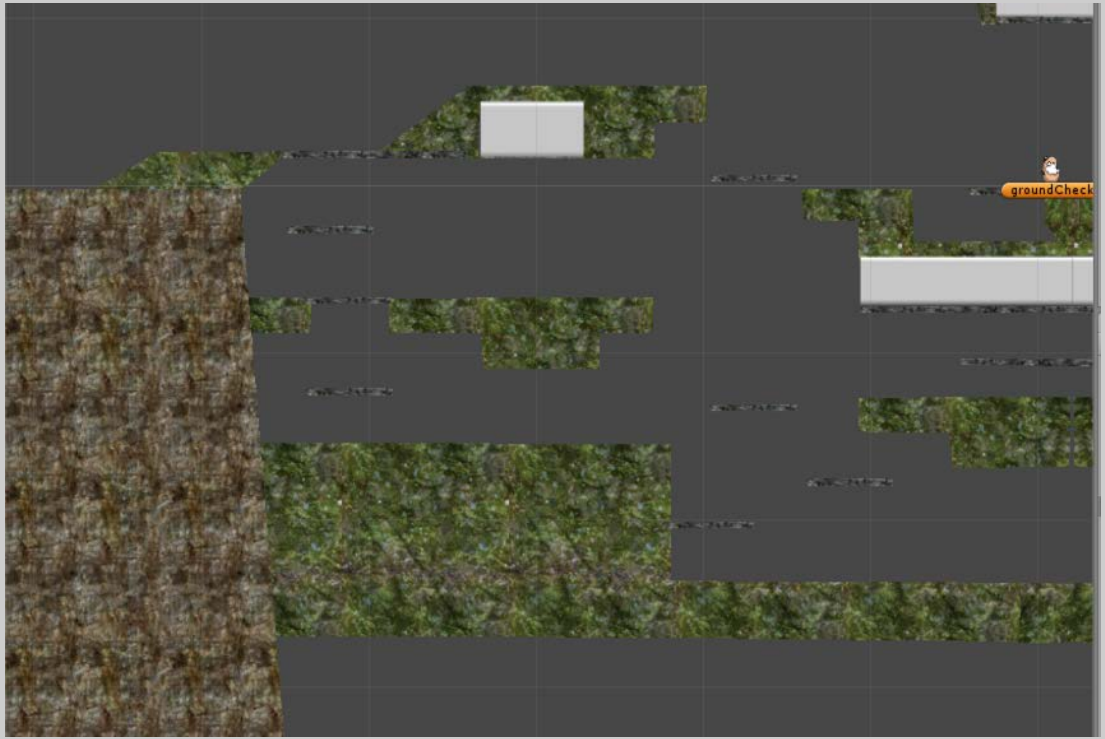
Artistic Direction (Initial Attempts)

- or lack thereof



Artistic Direction (Initial Attempts)

- crappy texturing?



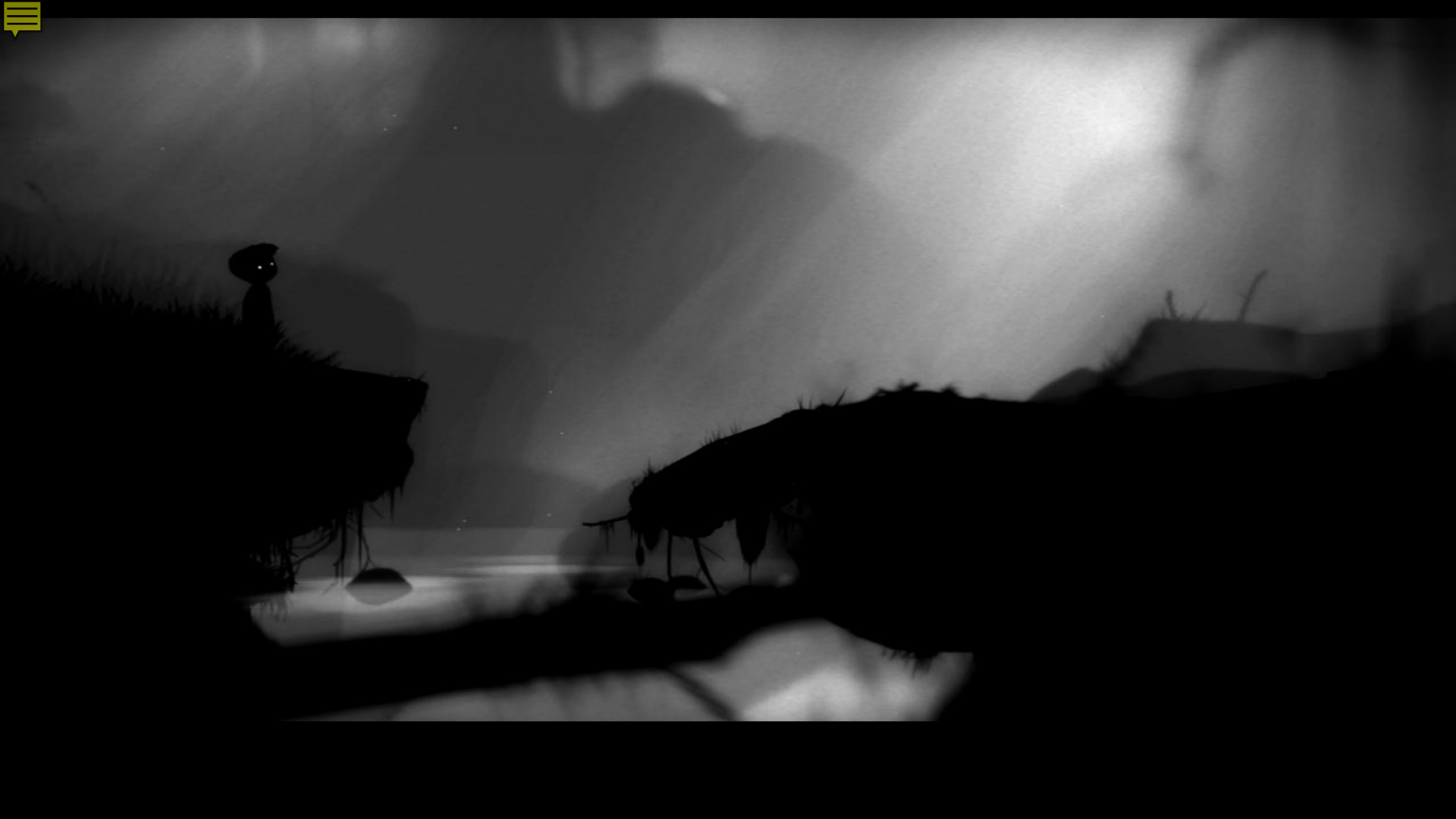
Artistic Direction (Refocusing)

- Goals
  - good looking
  - realistic explosion effects

- Constraints
  - no time
  - limited drawing experience

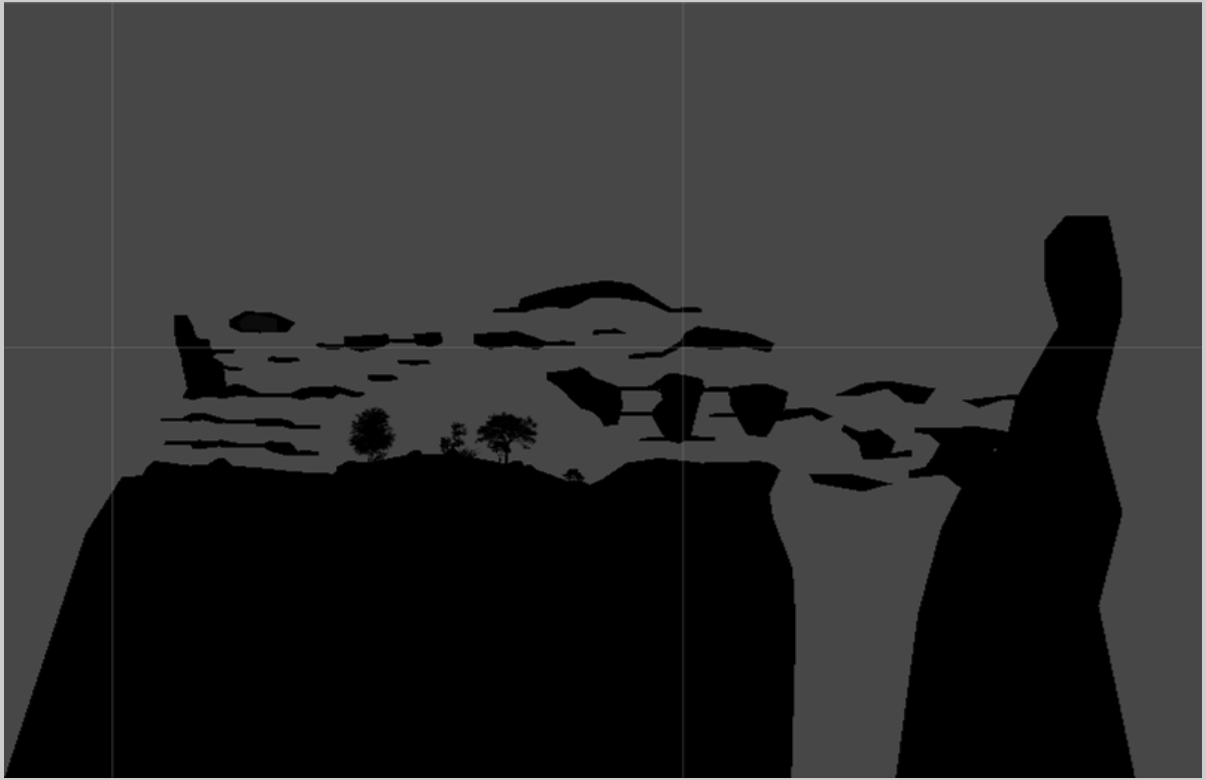
Artistic Direction (Refocusing)

- Good Looking
- Economical
  - Simple shapes, Single color palette
  - NO TEXTURES -> realistic explosions



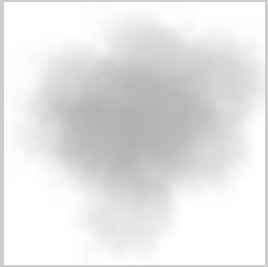
Artistic Direction (Map Design)

- Lacking Cloudy Blurred Feel



Artistic Direction (Map Design)

- Particle Systems
- Background



Artistic Direction (Map Design)

- Finalized

Artistic Direction (Map Touchups)

- Waterfall FX
- God Ray FX

Miscellaneous FX

Live Demo

- Destructible Vegetation
- Sound
- Explosion FX


Live Demo