Don't Let Go Bro

Features:

- Arcade climbing (platformer) in a dynamic, breakable world filled with pipes

- Configurable chain of manly, hand-holding bros (add or subtract bros as needed)

- Manage length of chain vs weight

- Handy skill system. Each bro has a unique skill: plumber, mechanic, locksmith, electrician

- Ubiquitous color-matching gameplay

 Fall 2018

Table of Contents

I pledge my honor that I have abided by the Stevens Honor System
- *Steph Oro, Robyn Verrill, Alex Massenzio, Adam Gincel, Christian Bouwense*

Introduction

'Don't Let Go Bro' is planned to be a mobile game in which a team of 'Bros' work together to swing between pipes and transverse puzzles. The independent 'Bros' link their hands and create chains which the user can drag between pipes. This game will include aspects of complex motion, world interaction, character strain, and puzzle solving.

The agile product owner, Mark Nelson, is an experienced Game Developer who has brought both this project and 'MegaCube' to the Stevens Senior Design Program. He has expressed that the goal of our project is to create a game that is both playable and fun for the end user. While Mark handles the art direction, publishing, and other business aspects, we are the programming backbone building and fleshing out his design into a workable product.

Technical Plan

This section describes the services and pieces of software we will be using while developing *Don't Let Go Bro*.

Category	What are we using?
Communication	
Email	Gmail
Web Conferencing	Discord
Instant Messaging	Telegram
Collaboration	
Document Collaboration	Google Drive
File Sharing/Data Tracking	GitHub
Developmental Task Delegation	Trello
Game Development	
Game Engine	Unity 2017.1
Scripting	C#
Environment	Windows 10
Exports (iOS, Android, PC)	Unity Game Engine

Team Introduction:

Steph Oro (soro@stevens.edu):
Role: Agile Lead, Algorithm Design, General Programming
Robyn Verrill (rverrill@stevens.edu):
Role: Unit Testing, General Programming
Adam Gincel (agincel@stevens.edu):
Role: UI/UX, General Programming
Christian Bouwense (cbouwens@stevens.edu):

Role: Characters and Interaction, General Programming

Alex Massenzio (amassenz@stevens.edu):

Role: Visual Effects, Game Mechanic Design, General Programming

Completion Schedule

Date	Game Progress
9/22/17	~~Object hierarchies in place, player controller and camera systems functional. Basic UI implemented.~~
9/29/17	~~Audio system implemented, level transitions and multiple levels functional.~~
10/6/17	~~Unlockable Objects, Fluids, Rats, Music, and Calculations~~
10/13/17	~~Rat AI, Specialty Pipes, Actual Character~~
10/20/17	First ten levels playable
10/27/17	Additional mechanic refinement, next five levels playable
11/3/17	UX Polish, level tuning
11/10/17	Level transition polish, player character art refinement
11/17/17	Playtesting, Build on top of existing systems, in preparation for future features
11/24/17	Re-evaluate objectives and ensure MVP is met
12/1/17	Final playtesting and tuning
12/8/17	Presentation of completed MVP

Dependency Graph
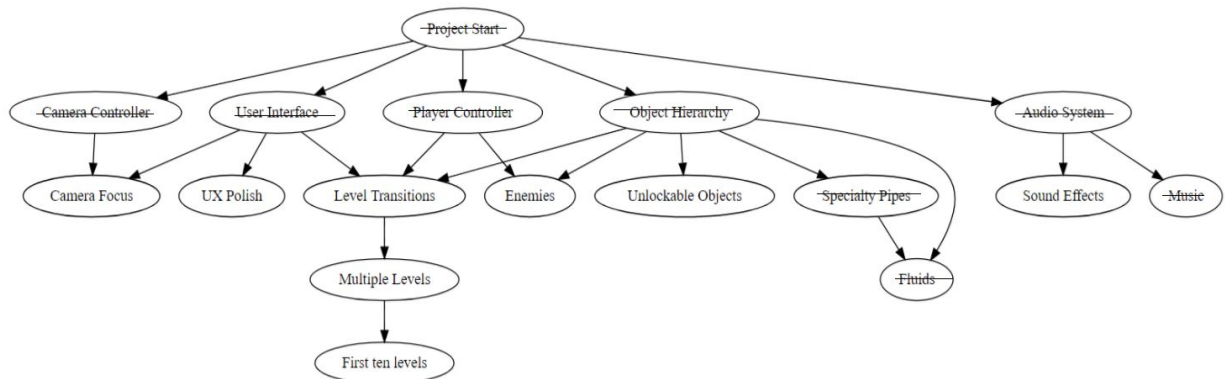
Delegation of Tasks

10 Weeks Left

~~Deliverable of September 22~~
- ~~Attractor (Steph)~~
- ~~Basic Pipe (Steph)~~
- ~~Basic Bro Rig (Robyn)~~
- ~~Pipe Specific Material (Steph)~~
- ~~Line Representation of Bro (Steph) #1, 2~~
- ~~BroLine attaches to Pipe (Steph) #1, 2~~
- ~~Camera Centers on BroLine (Alex)~~
- ~~Rat Prefab (Christian)~~
- ~~Box Platform (Christian)~~
- ~~UI Pause Button (Adam)~~
- ~~UI Bro Switcher (Adam)~~

~~Deliverable of September 29~~
- ~~Pipes and Line Ends are Functioning Attractors (Steph) #14~~
- ~~Limiting BroLine Movement and Length (Steph) #14~~
- ~~Interaction with Pipe/Lever/Interactable Objects via Hover Mechanic (Steph) #18, 20~~
- ~~Basic Menu, Level Selection (Adam)~~
- ~~Pan Camera on Drag (Alex)~~
- ~~Pan Camera on Arrow Keys (Alex)~~
- ~~Object Spawner (Robyn)~~
- ~~Next Level Object (Robyn)~~

Deliverable of October 6
- ~~Starting Pipe (Steph) #3~~
- ~~Rat Biting/Damage Mechanic (Christian)~~
- ~~Acid Drip (Christian)~~
- ~~Falling Object (Christian)~~
- Rest Mechanics (Robyn) #3,4,5
- ~~Weight Mechanics (Robyn)~~
- ~~Audio Mixing (Alex)~~
- ~~Audio Options Menu (Adam)~~
- ~~Fluid Flow (Steph)~~
- ~~Fluid Unlockable Object (Steph)~~

Deliverable of October 13
- ~~Rat AI Jump to Pipes Rough Implementation (Christian)~~
- ~~Rat AI Oscillating (Christian)~~
- ~~Thick/Thin Pipes (Robyn)~~
- ~~Pipe Breaking #8, 7, 13 (Robyn)~~
- ~~RealBro [BroLine Sequel] (Steph)~~

Deliverable of October 20
- Test Levels [Mechanic Levels, 1-9] (Adam)
- Test Levels [Mechanic Levels, 10-12] (Alex)
- Slippy Pipes #7, 10 (Alex)

- Sticky Pipes (Delay Release) #7, 11 (Alex)
- Moving Pipes #12, 7 (Adam)
- Bro focus switching #17 (Adam)
- Rat AI Jump to Pipes Completed (Christian)
- Hot Pipes #7, 9 Christian
- Bro Separation #15, 16 Steph
- Pipe Repair #19 Robyn

Deliverable of October 27
Deliverable of November 3
Deliverable of November 10
Deliverable of November 17
Deliverable of November 24
Deliverable of December 1
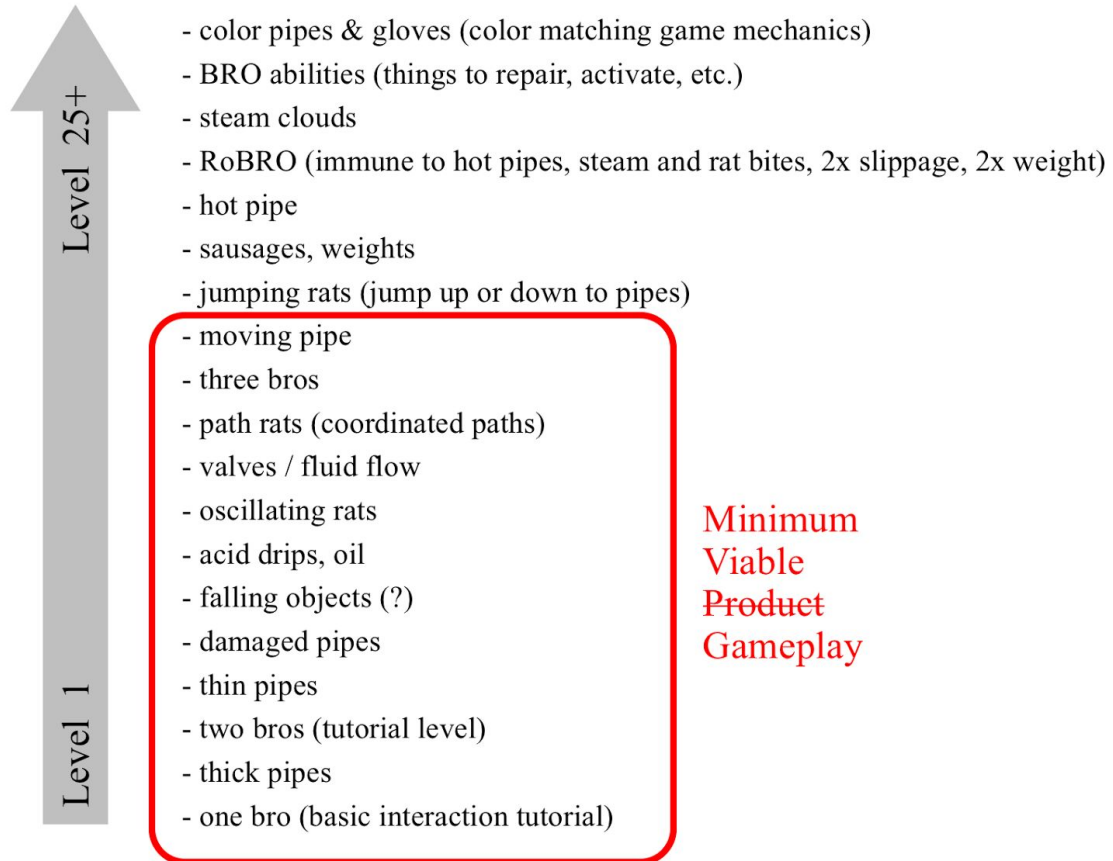Deliverable of December 8?

Development Deliverables

1. The player moves the free hand of the chain of BROs, positioning it in a graspable area (pipe surfaces)
2. Player can climb in ANY direction where there is a free graspable area
3. The player can have one end of the BRO chain freely moving. The other end MUST be attached to a pipe
4. When both ends of the BRO chain are attached to pipes, the BROs are considered resting/rested
5. When one hand is free, the BROs are exerting themselves and may fall from fatigue
6. Some pipe surfaces provide better handholds than others
7. Pipe surfaces can be normal, slippery, sticky, hot, moving or unstable
8. Unstable pipes can break apart, dropping the BOs
9. Hot pipes cause the BROs to eventually let go and fall
10. Slippery pipes can cause the BROs to slide down (vertical pipes) or lose their grip and fall (horizontal pipes)
11. Sticky pipes can cause BROs to climb more slowly (2x grip release time)
12. Moving pipes can cause the BRO chain to stretch too far, breaking them apart and causing them to fall
13. Longer BRO chains are heavier and break unstable groups of pipes more quickly
14. Longer BRO chains reach further and provide access to more distant sections of pipe (possibility space)
15. Each BRO can be separated from the chain and moved independently, creating up to 4 separate avatars
16. To separate BROs, press or mouse click on the connecting hands and pull them apart
17. Pressing the UI portrait of each BRO (upper right corner of UI) will center the view on that BRO avatar
18. All BROs can turn valves
19. All BROs can repair pipe

20. All BROs can pull (and hold) levers to open doors and activate machines

PLAY PROGRESSION

Level 25+

- color pipes & gloves (color matching game mechanics)
- BRO abilities (things to repair, activate, etc.)
- steam clouds
- RoBRO (immune to hot pipes, steam and rat bites, 2x slippage, 2x weight)
- hot pipe
- sausages, weights
- jumping rats (jump up or down to pipes)
- moving pipe
- three bros
- path rats (coordinated paths)
- valves / fluid flow
- oscillating rats
- acid drips, oil
- falling objects (?)
- damaged pipes
- thin pipes
- two bros (tutorial level)
- thick pipes
- one bro (basic interaction tutorial)

Level 1

Minimum
Viable
~~Product~~
Gameplay

Game Mechanics:

AVATAR FEEL

Physics Feel	Interactive Feel	Animated Feel

- Avatar is dragged around like a chain and anchored to pipes

- Does not present player with feeling of agency. Avatar feels like string of corpses

- Ragdoll

- Avatar is directed around by touching the free hand of a BRO

- The avatars "appear" to individually apply force to the whole chain to enable the free hand to reach in the direction the player is moving it in

- Fatigue / Collapse

- Sense of agency since you are controlling the avatar continuously

- The player taps the destination pipe and the avatar tries to find a movement solution to reach that pipe

- Probably lower sense of agency since you are **not** controlling the avatar from moment to moment

Week 4 Deliverables

<u>Robyn</u>
- Finished basic Pipe breaking
    - Pipe knows if it has been broken
- Differentiated thick vs thin pipes
    - Thick pipes can sustain more weight and are visible thicker

Week 3 Deliverables

<u>Steph</u>

<u>Robyn</u>
- Added a weight interface
    - Objects have a max weight and tack their current weight
- Added the Rest vs Stress mechanic to Bros
    - Bros now have a timer that tires them out if they are only hanging from 1 hand
- Added basic Pipe breaking (slightly ahead of schedule)
    - Pipe knows if it has been broken
- Modified the existing spawner function to include multiple spawns at intervals

<u>Adam</u>

<u>Alex</u>

<u>Christian</u>
- Began work on Rat AI algorithm for jumping to pipes once they reach a ledge
    - Initial work finds pipes, calculates velocity needed to jump to the detected pipe, and jumps with that velocity.
    - Some issues have not been ironed out, and the jump arcs are not very pretty. However, the algorithm itself is fine, some parameters just need to be tweaked.

Latest Work

Steph
- Limits LineBro Extension
- Line Ends are Attractors Now
- Interactable
    - C# Class
    - Subclassable for Use Cases
    - Triggers When a Bro enters/exits its collider
- Valve
    - C# Class
    - Example of Intractable Subclass
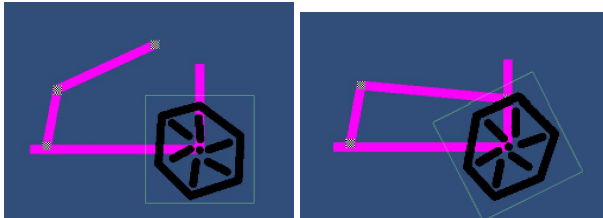
Robyn
- Wrote a spawner object that can spawn any gameobject

- Takes in information on what object to spawn, where to spawn it, and how many to spawn
- Wrote a level switching Interactable object
    - Switches the scene when a bro interacts with it

Christian
- Wrote Character super-class which will be attached to all non-bro characters
    - Includes generic stats like health, damage, speed, etc.
    - Starts moving across a platform and reverses direction if it reaches the end
- Polished Physics Object class
- Included temporary sprite for rat and added Character class to its prefab to demonstrate movement implementation

Adam
- Multi-resolution artwork
- First sample song

Alex
- Tracklist integration
- Music Player

Older Work

Steph
- Bro Point
    - C# Class
    - Can Be Dragged by User
    - Can Snap to Pipe if Dragged to a Pipe
    - Can Hang Free in Air if not Released by a Pipe.
    - Render & Editable in Editing Mode as Well
- Bro Line
    - Spans Two Bro Points Visually
    - Renders in Editing Mode as Well
- Attractors
    - C# Class
    - Has a Material
- Pipes
    - C# Class
    - Horizontal and Vertical Prefabs & Modes
    - Rendered as a Line
    - BroLine Can Connect and Snap to Pipes
    - Generate Colliders
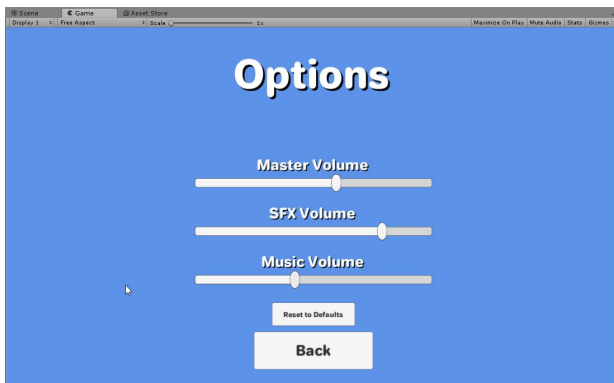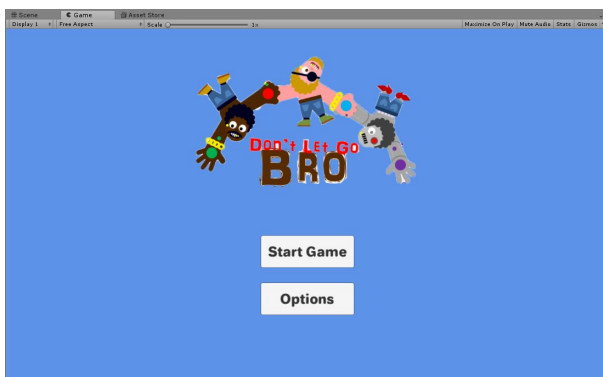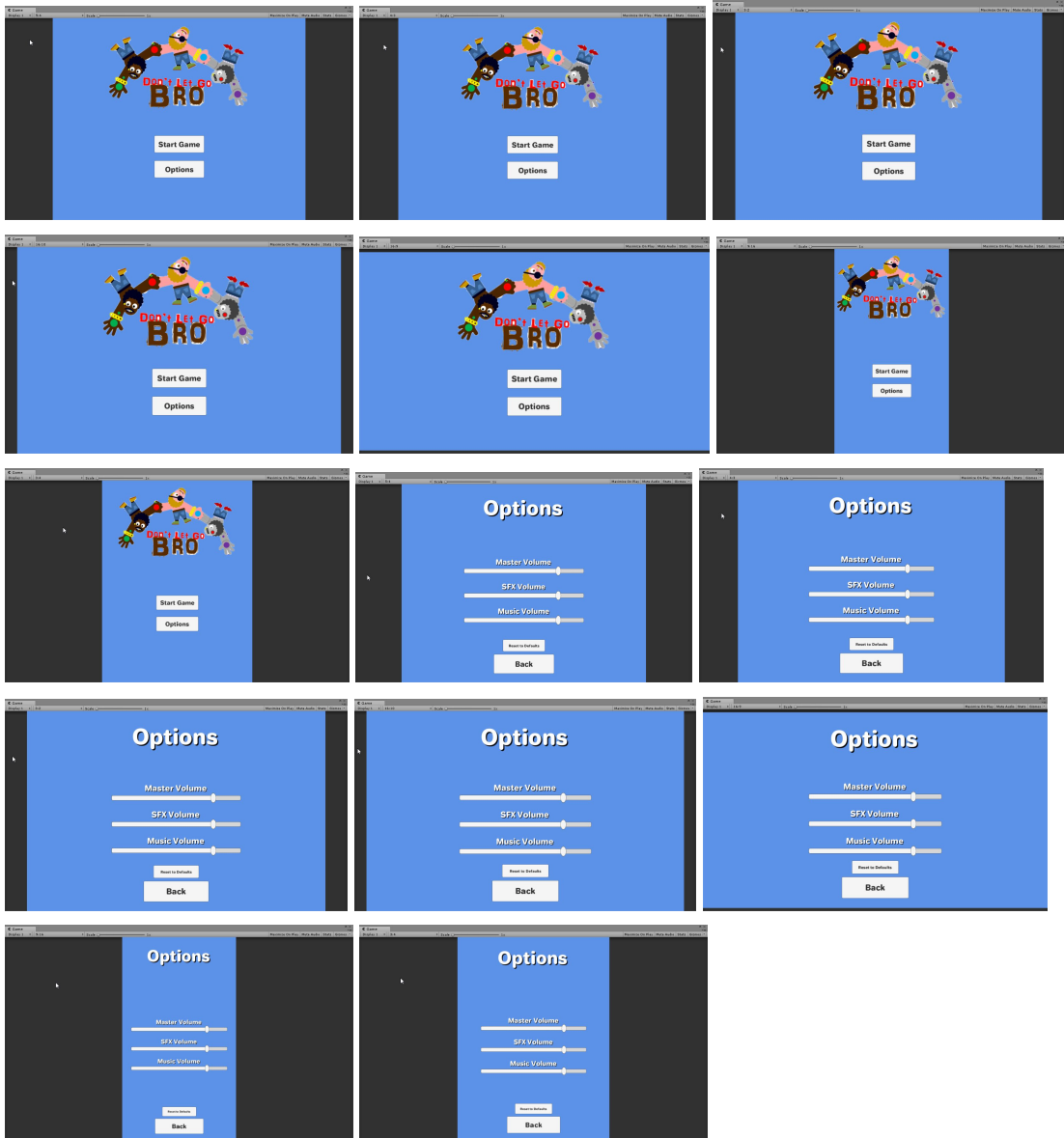   - Render & Editable in Editing Mode as Well
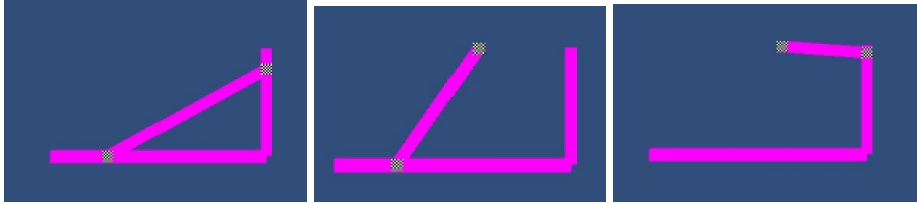
Adam
- UI Canvas Layer
- Pause Button
- Bro Profile Switching Buttons (Labelled 1, 2, & 3)
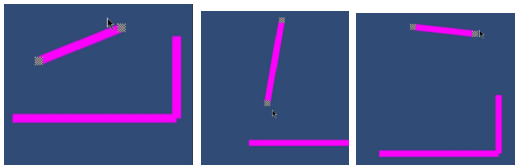

- Main menu

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- UI at different resolutions (important for multi-device compatibility)

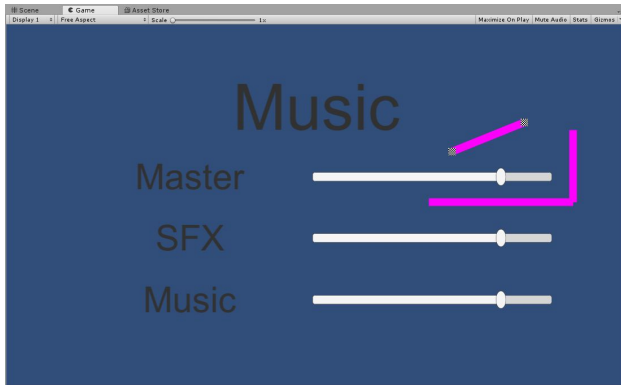Alex
- Camera Follow
    - C# Class
- Average of bro positions becomes center of camera focus
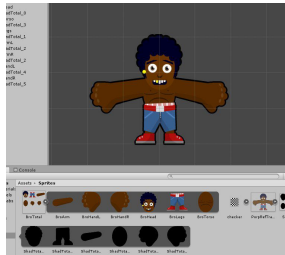- Smooth Interpolation as Bros Move

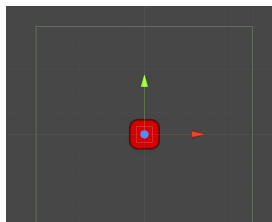- AudioMixer class and sliders

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Robyn

- Bro Prefab
    - Basic Sprite Setup
    - Establish Appropriate Character Size and Proportions
    - Layered and Groups Parts appropriately
    - Readied for Animation Scripting

Christian Bouwense

- Rat Prefab
    - C# Class

- Box Platform
    - C# Class