

# Game Design & Development

## Unity Git Workflow – Lecture 5

Michael Holly

1

# Game Recap

... Who has played Line Rider?

Chat: [I]

# Game Recap

... What is the main goal of the game ...?

Chat: ...

# Game Recap

... What are the main game design elements ...?

Chat: ...

# How to implement Line Rider in Unity?

... Any ideas?

# How to implement Line Rider in Unity?



[\(2\) How to make a LINE RIDER Replica in Unity \(Livestream Tutorial\) - YouTube](#)

# How to manage your Unity Project

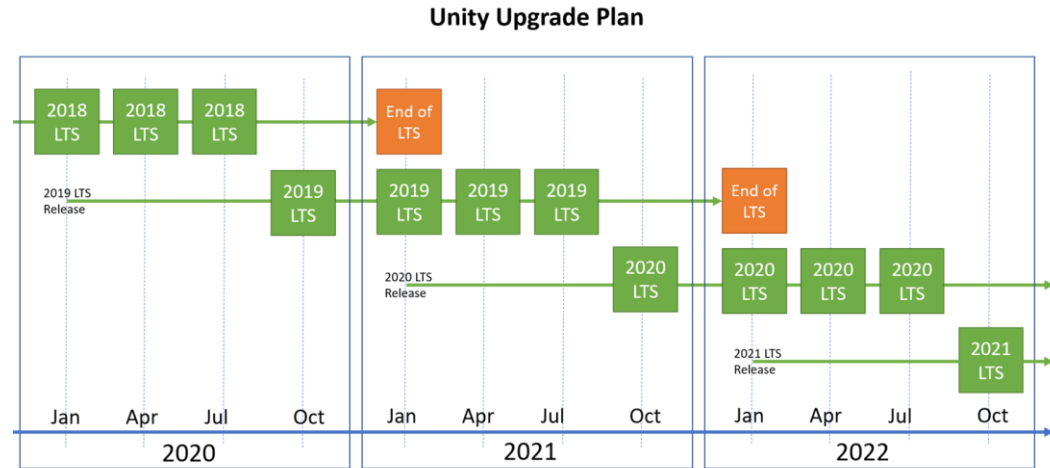
1. Directory Structure
2. Scene hierarchy structure
3. Prefabs for everything
4. Version Control System (GIT)



# Managing Software Versions

- Use stable versions
- Plan when to update to which version

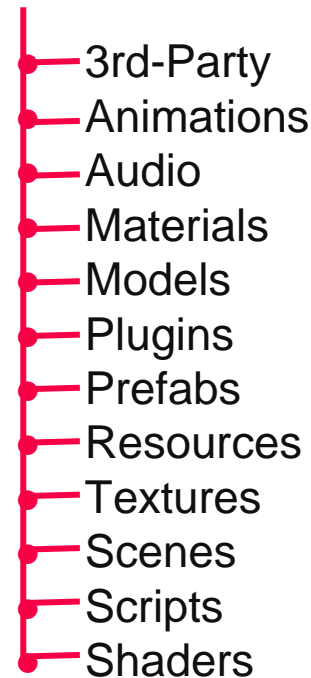
Name	Version	Download
SteamVR	1.2.3	<a href="#">SteamVR Plugin</a>
VRTK	3.3.0	<a href="#">VRTK Plugin</a>
HTC Vive		<a href="#">HTC Vive</a>
Oculus		<a href="#">Oculus Integration</a>
Samsung Gear VR		<a href="#">Samsung Gear VR</a>



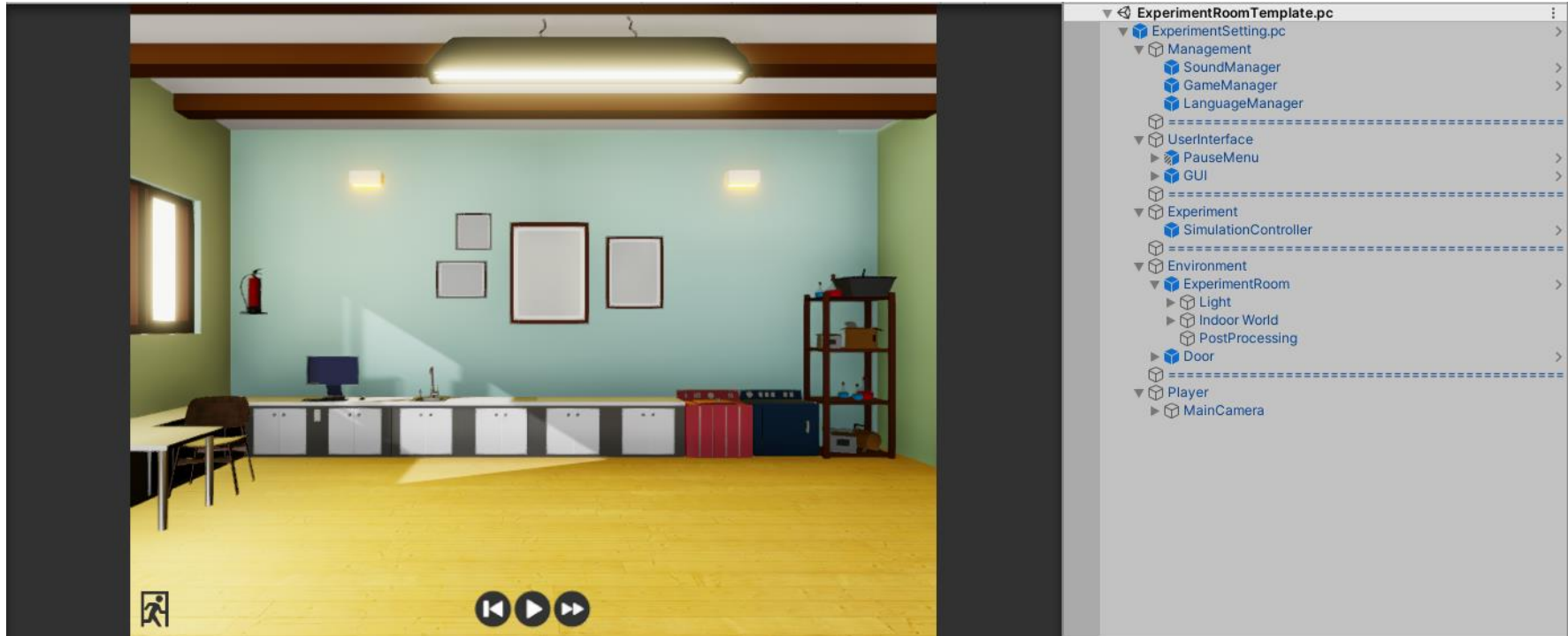


# Directory Structure

- Do not store any asset files in the root directory
- Do not store any additional directories in the root directory
- Be consistent with naming
- Use 3rd-Party folder to store imported assets

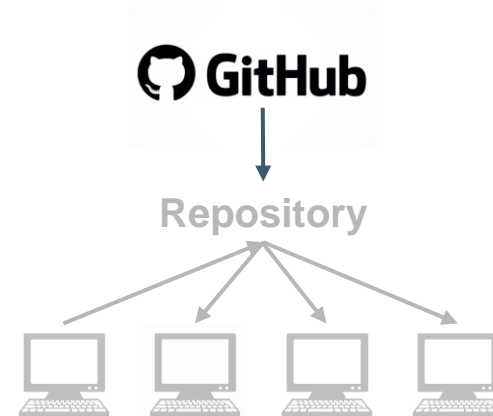
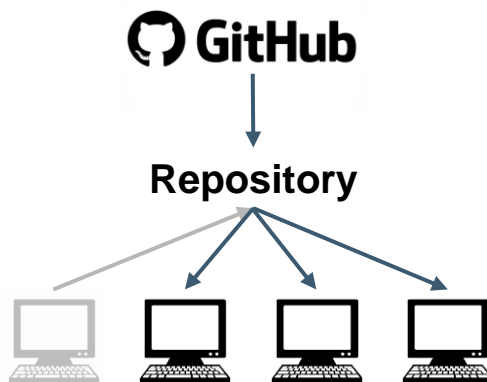
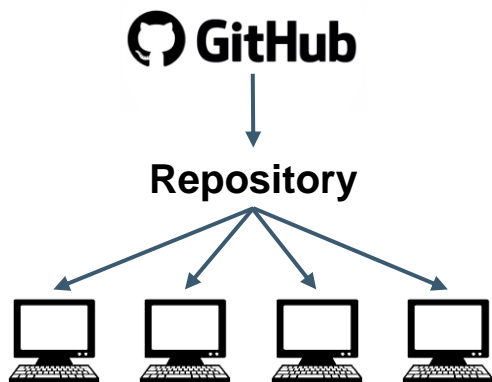


# Scene Hierarchy Structure



# Version Control System - GIT

- Tracks the changes you make to files
- Github - to host and control your project using Git
- Repository to store your project

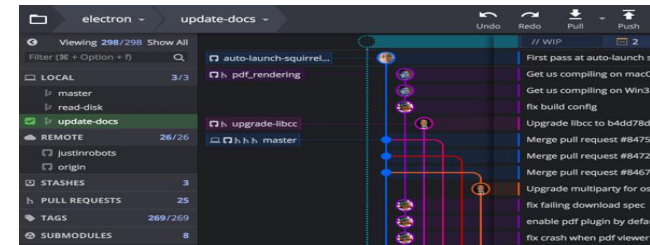
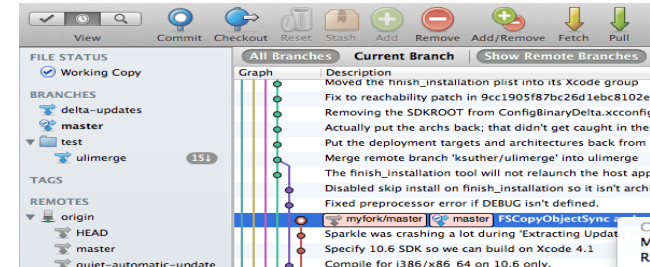
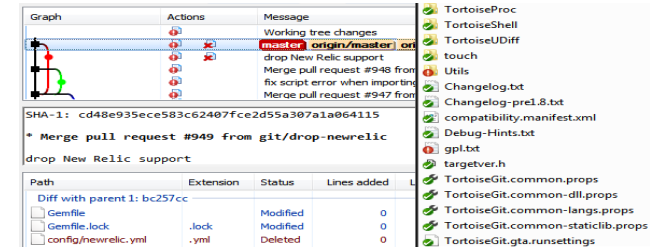


# Hho uses the commandline for GIT?

# Who uses a UI for GIT?

# Git Desktop Client

- Github Desktop
- TortoiseGit
- SourceTree
- GitKraken



# Git Large File Storage

```
git lfs install
```

```
git lfs track "*.mp4"
```

## .gitattributes

```
## git-lfs ##
```

```
#Image
```

```
*.jpg filter=lfs diff=lfs merge=lfs -text
```

```
*.png filter=lfs diff=lfs merge=lfs -text
```

```
#Audio
```

```
*.mp3 filter=lfs diff=lfs merge=lfs -text
```

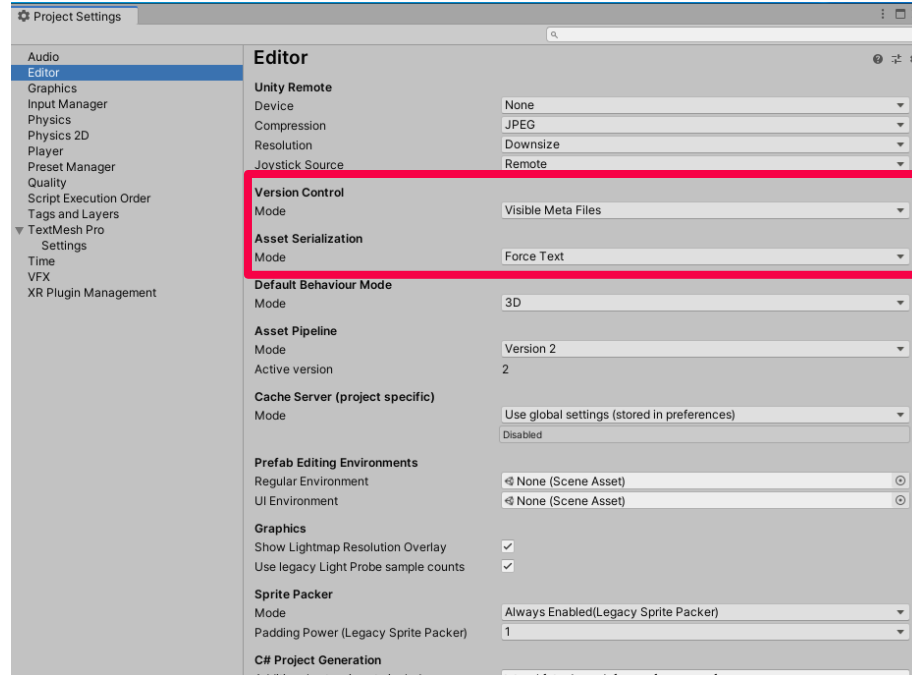
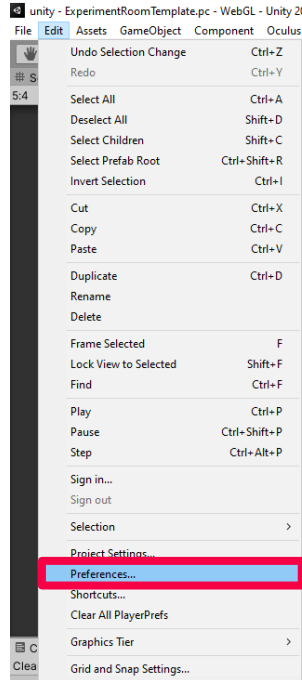
```
*.wav filter=lfs diff=lfs merge=lfs -text
```

```
#Video
```

```
*.mp4 filter=lfs diff=lfs merge=lfs -text
```


```
*.mov filter=lfs diff=lfs merge=lfs -text
```

# Setting Up Unity





# Setting Up GitHub



GameLabGraz

The GLG focus is on showing the full potential of video games by designing and researching virtual, engaging, and immersive experiences.

Graz, Austria <https://gameabgraz.com>

[Repositories 11](#)
[Packages](#)
[People 6](#)
[Teams 1](#)
[Projects 1](#)
[Settings](#)

Type: All
Language: All

[Customize pins](#)
[New](#)

## Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Owner
Repository name

GameLabGraz / MyUnityProject

Great repository names are short and memorable. Need inspiration? How about [scaling-succotash?](#)

Description (optional)

☒ **Public**  
Anyone on the internet can see this repository. You choose who can commit.

☐ **Private**  
You choose who can see and commit to this repository.

**Initialize this repository with:**  
Skip this step if you're importing an existing repository.

☒ **Add a README file**  
This is where you can write a long description for your project. [Learn more.](#)

☒ **Add .gitignore**  
Choose which files not to track from a list of templates. [Learn more.](#)

.gitignore template: None

.gitignore template
unity

☐ **Use the .gitignore template for code.** [Learn more.](#)

This repository will be created with the default name in GameLabGraz's settings.

[Create repository](#)

# Repository Permissions

- Read
- Write
- Maintain
- Admin

# Project Workflow

GameLabGraz / Maroon

Unwatch 12 Unstar 11

<> Code Issues 60 Pull requests 3 Actions Projects 1 Wiki Security Insights Settings

is:open

New project

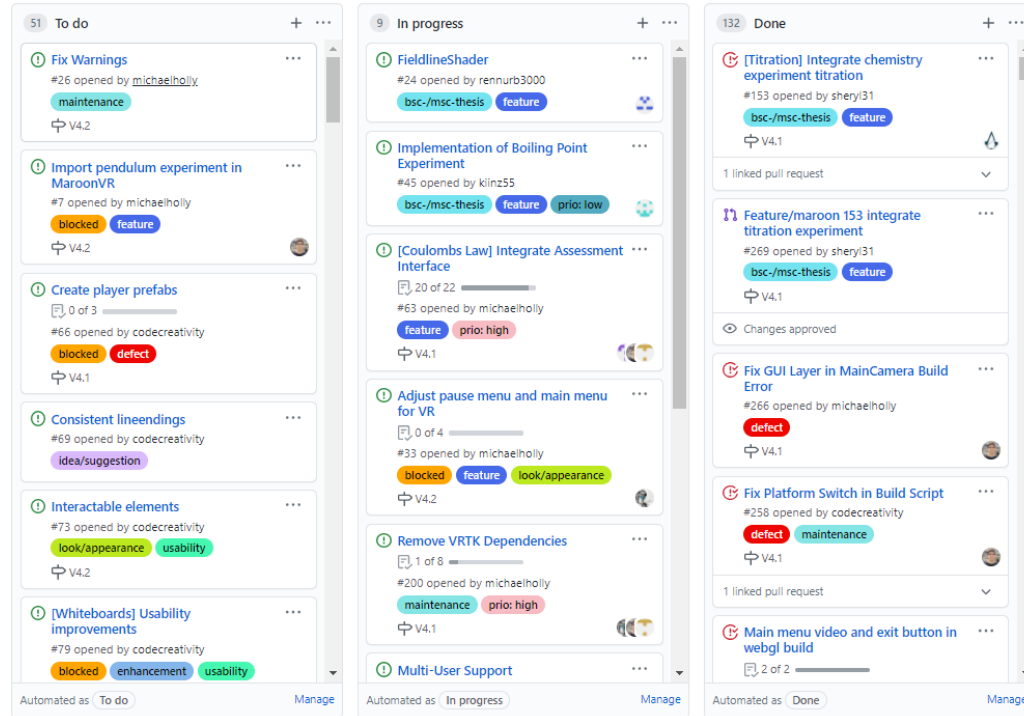
1 Open 0 Closed Sort

**Maroon**  
Updated 2 days ago

A interactive physics laboratory and experiment environment implemented in Unity3D, designed for active learning in the classroom or at home. It visualizes and simulates various physics experiments.



# Project Workflow



The screenshot displays a Kanban board with three columns: 'To do' (51 items), 'In progress' (9 items), and 'Done' (132 items). Each item is a task card with a title, ID, assigner, status tags, and version information.

### To do (51 items)

- Fix Warnings** (#26, opened by michaelholly, maintenance, V4.2)
- Import pendulum experiment in MaroonVR** (#7, opened by michaelholly, blocked, feature, V4.2)
- Create player prefabs** (#66, opened by codecreativity, blocked, defect, V4.1)
- Consistent lineendings** (#69, opened by codecreativity, idea/suggestion)
- Interactive elements** (#73, opened by codecreativity, look/appearance, usability, V4.2)
- [Whiteboards] Usability improvements** (#79, opened by codecreativity, blocked, enhancement, usability)

### In progress (9 items)

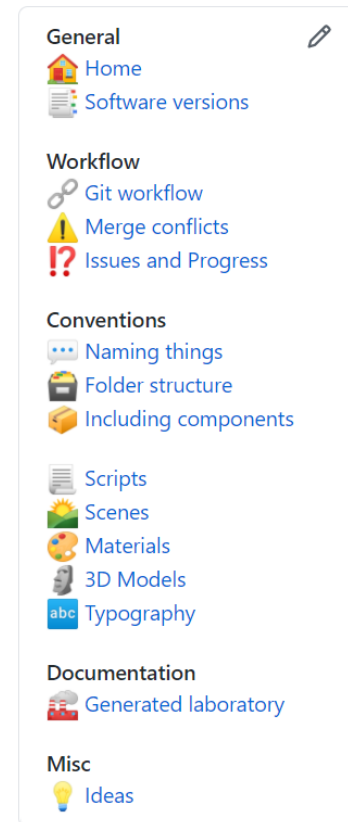
- FieldlineShader** (#24, opened by rennurb3000, bsc-/msc-thesis, feature)
- Implementation of Boiling Point Experiment** (#45, opened by Klinz55, bsc-/msc-thesis, feature, prio: low)
- [Coulombs Law] Integrate Assessment Interface** (#20 of 22, #63, opened by michaelholly, feature, prio: high, V4.1)
- Adjust pause menu and main menu for VR** (#0 of 4, #33, opened by michaelholly, blocked, feature, look/appearance, V4.2)
- Remove VRTK Dependencies** (#1 of 8, #200, opened by michaelholly, maintenance, prio: high, V4.1)
- Multi-User Support**

### Done (132 items)

- [Titration] Integrate chemistry experiment titration** (#153, opened by shery31, bsc-/msc-thesis, feature, V4.1)
- Feature/maroon 153 integrate titration experiment** (#269, opened by shery31, bsc-/msc-thesis, feature, V4.1)
- Fix GUI Layer in MainCamera Build Error** (#266, opened by michaelholly, defect, V4.1)
- Fix Platform Switch in Build Script** (#258, opened by codecreativity, defect, maintenance, V4.1)
- Main menu video and exit button in webgl build** (#2 of 2)


# Github Wiki

- Documentation for your repository
- Share long-form content about your project
- Different to Readme
- Edit on GitHub or locally



# Issues

<> Code
Issues 47
Pull requests 1
Actions
Projects 1
Wiki
Security
Insights
Settings



Write
Preview

AA
B
i
“
”
<
>
@

Leave a comment

Attach files by dragging & dropping, selecting or pasting them.

Styling with Markdown is supported

Submit new issue

Assignees
No one—assign yourself

Labels
None yet

Projects
None yet

Milestone
No milestone

Linked pull requests
Successfully merging a pull request may close this issue.
None yet

Helpful resources
GitHub Community Guidelines

action
blocked
defect
duplicate
enhancement
feature
help wanted
idea/suggestion
integration
look/appearance
question

## Issue: Defect Report

Create a report to help us improve. If this doesn't look right, [choose a different type](#).



Title

Write

Preview

### Describe the defect

A clear and concise description of what the bug is.

### To Reproduce

Steps to reproduce the behavior:

1. Go to '...'
2. Click on '...'
3. Scroll down to '...'
4. See error

### Expected behavior

A clear and concise description of what you expected to happen.

### Found in version

The version where the defect was detected [e.g. v4.1 build 20210224]

### Screenshots

If applicable, add screenshots to help explain your problem.

### Desktop (please complete the following information):

- OS: [e.g. Windows]
- Version [e.g. 22]

### WebGL (please complete the following information):

- OS: [e.g. Windows]
- Browser [e.g. Chrome]
- Version [e.g. 22]

### VR (please complete the following information):

- Device: [e.g. HTC Vive]

### Assignees

No one—assign yourself

### Labels

defect

### Projects

None yet

### Milestone

No milestone

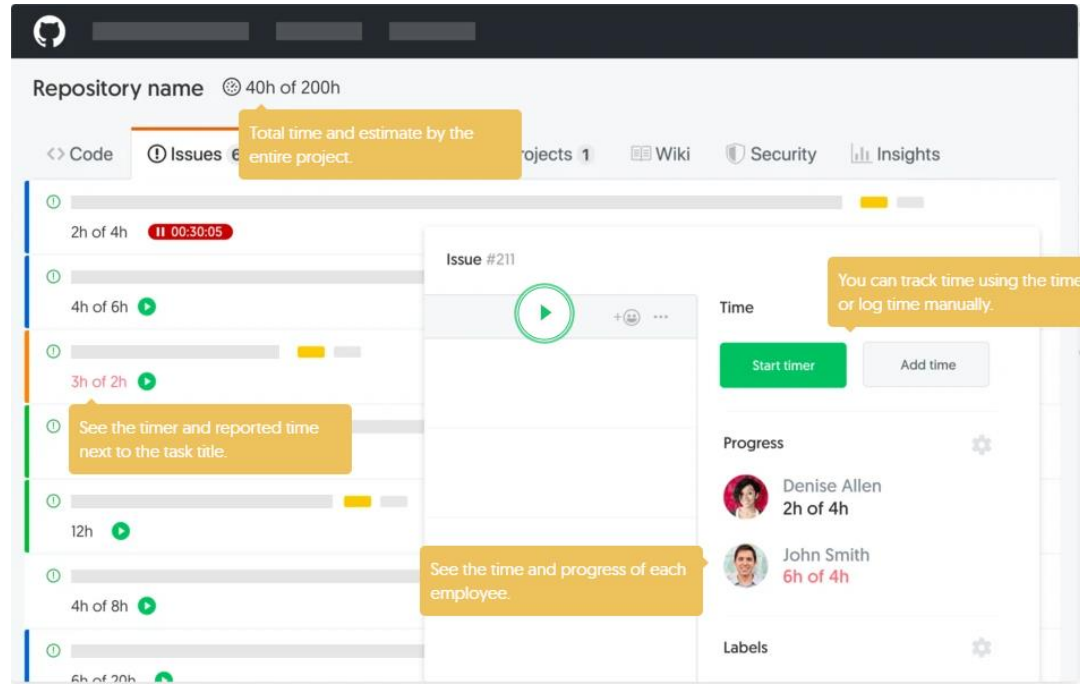
### Development

Shows branches and pull requests linked to this issue.

### Helpful resources

[GitHub Community Guidelines](#)

# Time Tracking

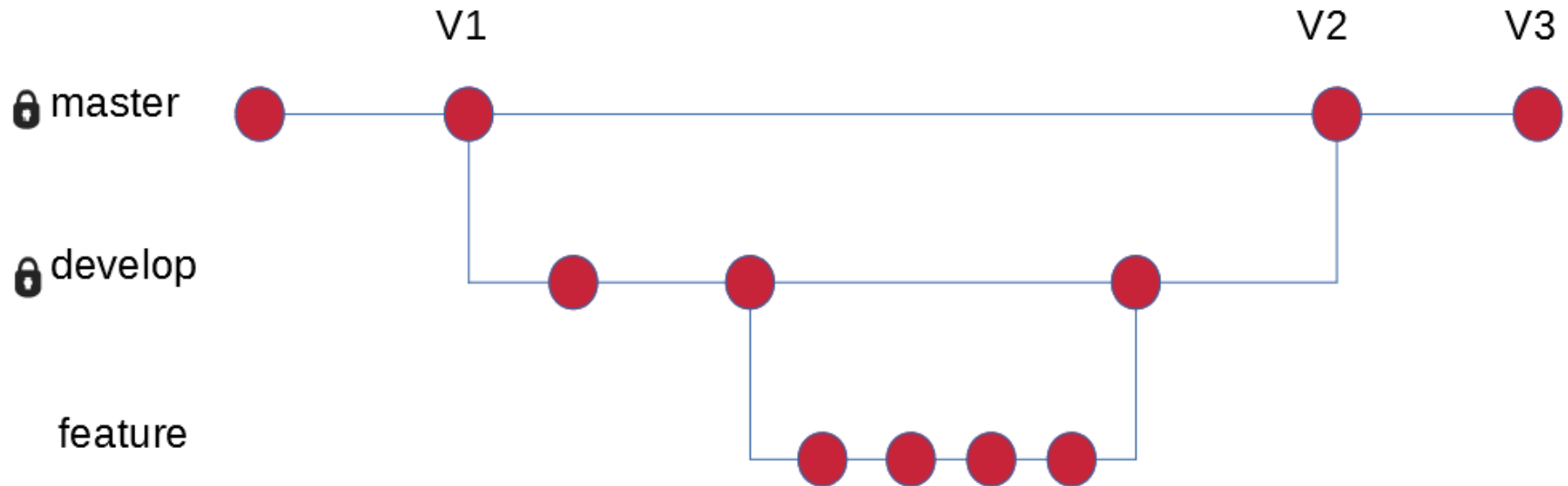


The screenshot shows the GitHub Time Tracker interface. At the top, there's a header with the repository name and a total time estimate of 40h of 200h. Below this, there are tabs for Code, Issues, Projects, Wiki, Security, and Insights. The Issues tab is active, showing a list of issues with progress bars. A callout box points to the 'Total time and estimate by the entire project' text. Another callout points to a progress bar for an issue, stating 'See the timer and reported time next to the task title.' A third callout points to the 'Issue #211' title, stating 'See the time and progress of each employee.' On the right side, there's a panel for 'Issue #211' with a 'Time' section containing 'Start timer' and 'Add time' buttons. A callout box points to this section, stating 'You can track time using the timer or log time manually.' Below the 'Time' section is a 'Progress' section showing the progress of two employees: Denise Allen (2h of 4h) and John Smith (6h of 4h). There is also a 'Labels' section at the bottom right.

[GitHub Time Tracker and Estimates for GitHub Issues \(everhour.com\)](https://everhour.com)



# Git Workflow



# Git Workflow

- Protected branches: master/main, develop
- All commits must be made to a non-protected branch
- Separate branch for each feature

## Branch Protection Rules

- Require pull request reviews before merging
- Dismiss stale pull request approvals when new commits are pushed
- Restrict who can dismiss pull request reviews
- Restrict who can push to matching branches

# Feature Branches

- feature/<project\_name>-<issue-number>\_<short issue description>
- Commit Message:
  - <project\_name>-<issue-number>\_<short issue description>
  - Empty line
  - <Description>
- Clean Commit History
  - git commit -amend
  - git squash

# Feature Branches

1. Create new feature branch  
git checkout -b myFeature develop
1. Commit your changes  
git commit -m "my changes"
1. Amend your changes for a clean history  
git commit -amend
1. Push your feature branch  
git push
1. Create Pull Request on Github

# Pull Requests

Filters ▾

Labels 14
Milestones 2

New pull request

<input type="checkbox"/>	3 Open	<input checked="" type="checkbox"/> 81 Closed	Author ▾	Label ▾	Projects ▾	Milestones ▾	Reviews ▾	Assignee ▾	Sort ▾
<input type="checkbox"/>	Maroon-270 Disable Roof and Front Wall of the Experiment Room during Light Baking						1		
	#271 opened 2 days ago by michaelholly • Review required  V4.1								
<input type="checkbox"/>	Hints for WebGL on mobile devices <span>defect</span>						1		
	#265 opened on 25 Sep by codecreativity • Review required  V4.1								
<input type="checkbox"/>	Feature/maroon 63 assessmentsystem coulomb						1		3
	#194 opened on 2 Jul by codecreativity • Draft								

# Pull Requests - Reviews



## Review required

[Show all reviewers](#)

At least 1 approving review is required by reviewers with write access. [Learn more.](#)



1 pending reviewer



## Merging is blocked

Merging can be performed automatically with 1 approving review.

As an administrator, you may still merge this pull request

Squash and merge



You can also [open this in GitHub Desktop](#) or view [command line i](#)

...actored/scenes/experiments/HuygensPrinciple/scrip  
ts/InterferencePlate.cs

Outdated



Hide resolved

... @@ -0,0 +1,55 @@

1

+ using Maroon.Physics;



michaelholly on 19 Aug

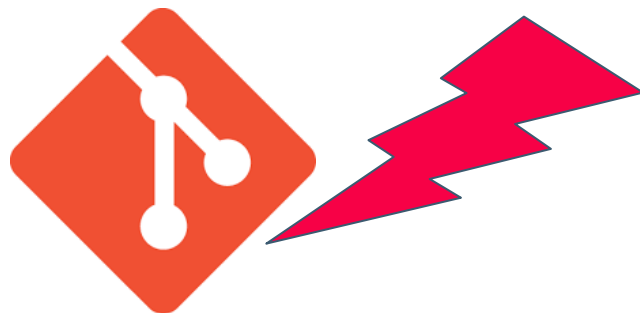
Member



Please remove unnecessary using directives.

# Merge Conflicts

- Meta files must be visible
- Plain text serialization must be active
- Do not allow an automatic merge for scenes and prefab files



[Unity - Manual: Smart Merge \(unity3d.com\)](https://unity3d.com/manual/SmartMerge)





# Merge Process

1. Git merge is initiated

```
git merge develop
```

1. A merge conflict occurs

2. Developer starts Unity yaml merge tool

```
git mergetool --tool=unityyamlmerge
```

1. Unity yaml merge tool automatically opens another merge tool if it cannot resolve all conflicts
2. Developer resolves conflicts and saves merged file
3. Results can be inspected and the merge can be completed

# Unity Packages

- manifest.json

```
{
  "dependencies": {
    "com.gear.languagemanager": "https://github.com/GameLabGraz/Utilities.git#package/languagemanager",
    "com.gear.serializeproperty": "https://github.com/GameLabGraz/Utilities.git#package/serializeproperty",
    "com.unity.2d.sprite": "1.0.0",
    "com.unity.2d.tilemap": "1.0.0",
```

- packages-lock.json

```
{
  "dependencies": {
    "com.gear.languagemanager": {
      "version": "https://github.com/GameLabGraz/Utilities.git#package/languagemanager",
      "depth": 0,
      "source": "git",
      "dependencies": {
        "com.unity.textmeshpro": "1.4.1"
      },
      "hash": "b9ede28c705f209d7b833de67b7a77d9ffb6cfb8"
    },
    "com.gear.serializeproperty": {
      "version": "https://github.com/GameLabGraz/Utilities.git#package/serializeproperty",
      "depth": 0,
      "source": "git",
      "dependencies": {},
      "hash": "52b5f5d526bbd170a699f009a832b1d7cf02328a"
    }
  },
```

# Git Subtrees

- Management of simple workflow is easy
- User can ignore that you are using git subtree to manage dependencies.
- Content of the module can be modified without having a separate repository copy of the dependency somewhere else.

# Publishing Unity Packages on Git Repository

```
git subtree push --prefix
<package path> origin package/<package name>
```

origin/develop



origin/package/  
<package name>



# Automatic Unity Build Uploader

