



**YOU DON'T NEED THE
BEVY EDITOR YOU
THINK YOU NEED**



**BUT THE ONE YOU
DIDN'T KNOW WAS
POSSIBLE**

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Bevy Game Development Meetup #1 - 2024-01-30

THOUGHTS ON THE BEVY EDITOR

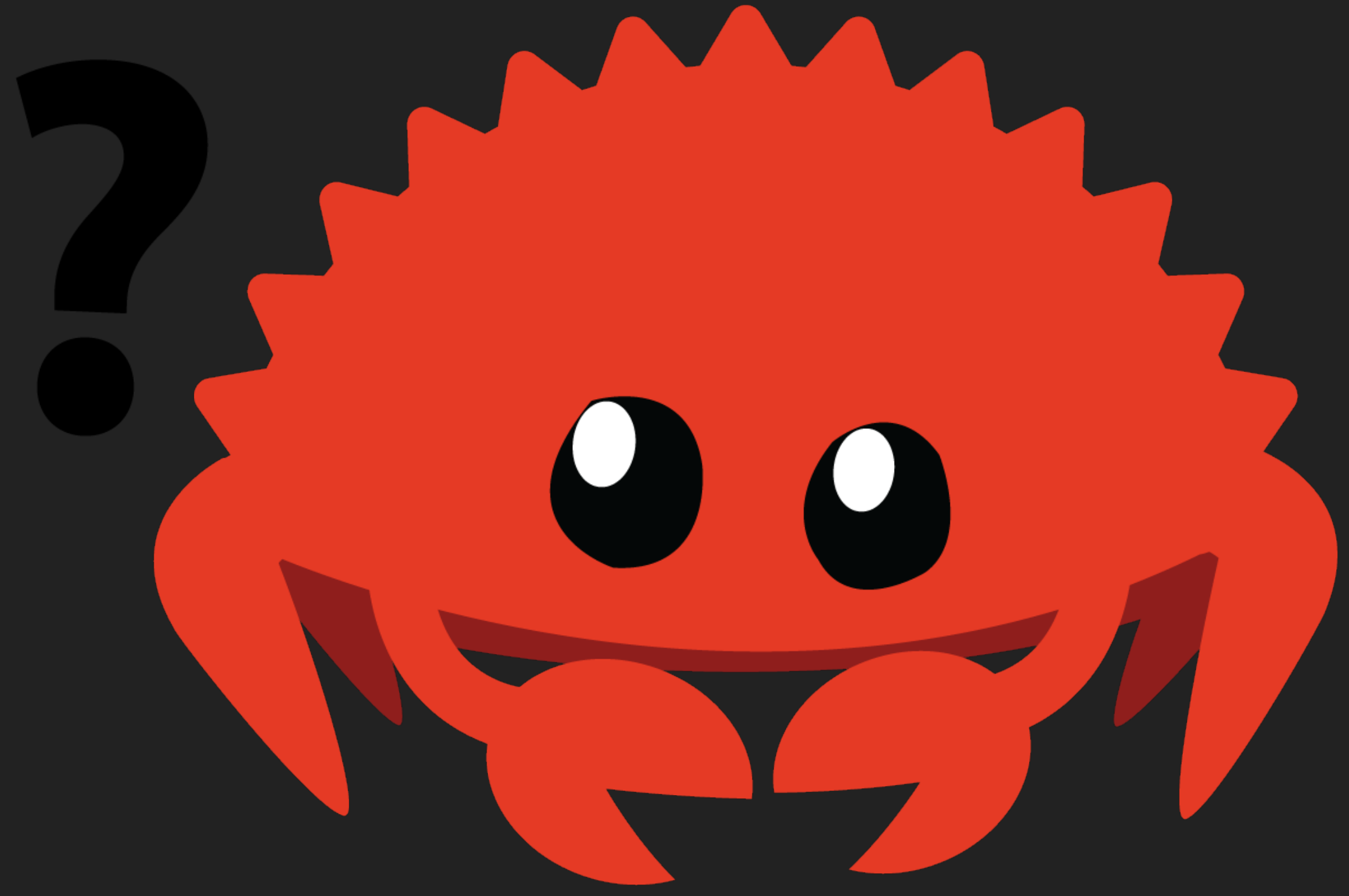
WHO AM I



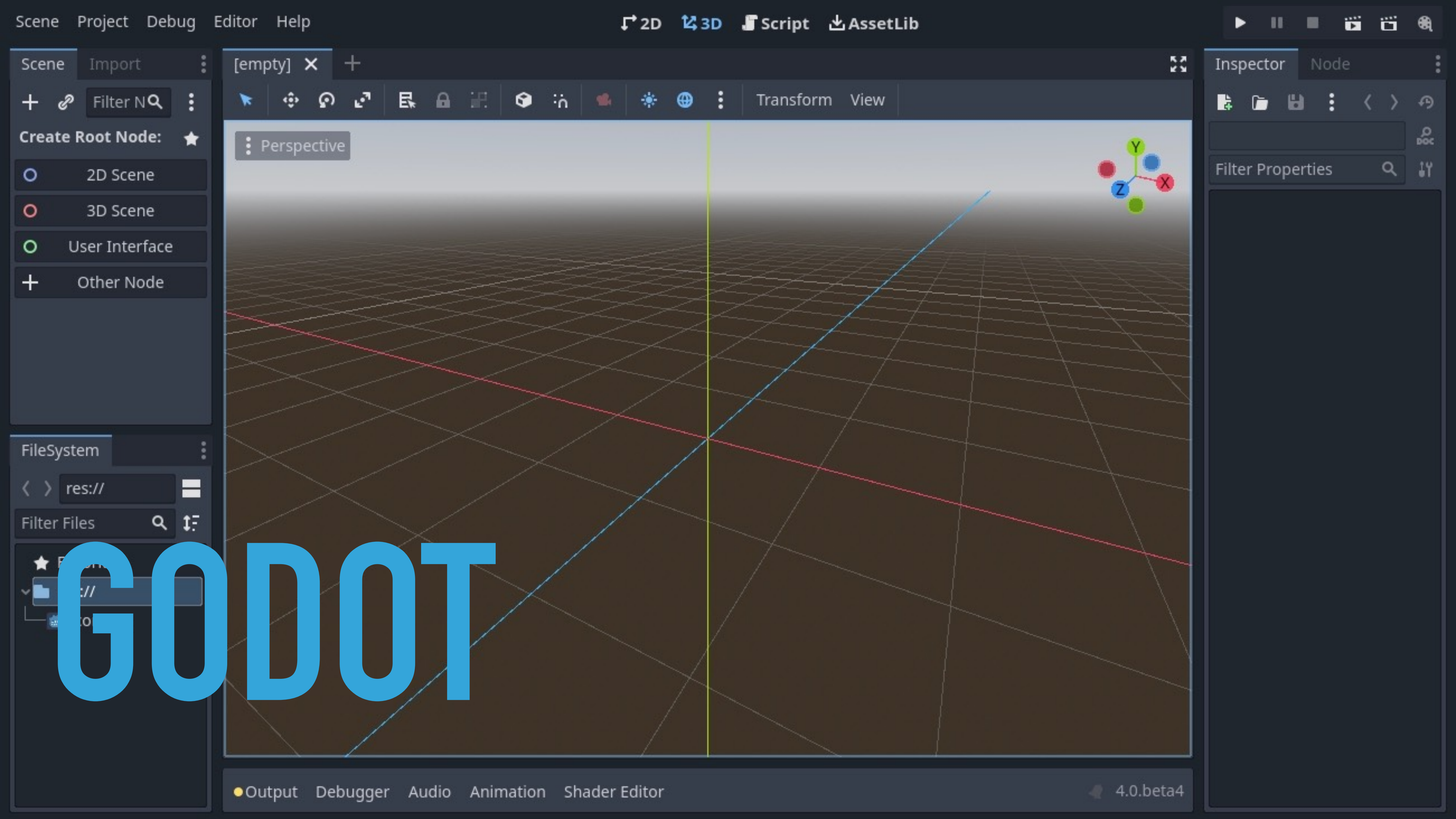
- ▶ François Mockers, mockersf on GitHub
- ▶ Using (and contributing to) Bevy since the 0.2
- ▶ Maintainer and SME on several topics
- ▶ Come talk to me if you have ideas to improve testing the engine!

DISCLAIMER

- ▶ These are my personal thoughts
- ▶ They do not represent:
 - ▶ The direction of the Bevy project
 - ▶ The opinions of the other maintainers
 - ▶ My actions on PRs related to the editor

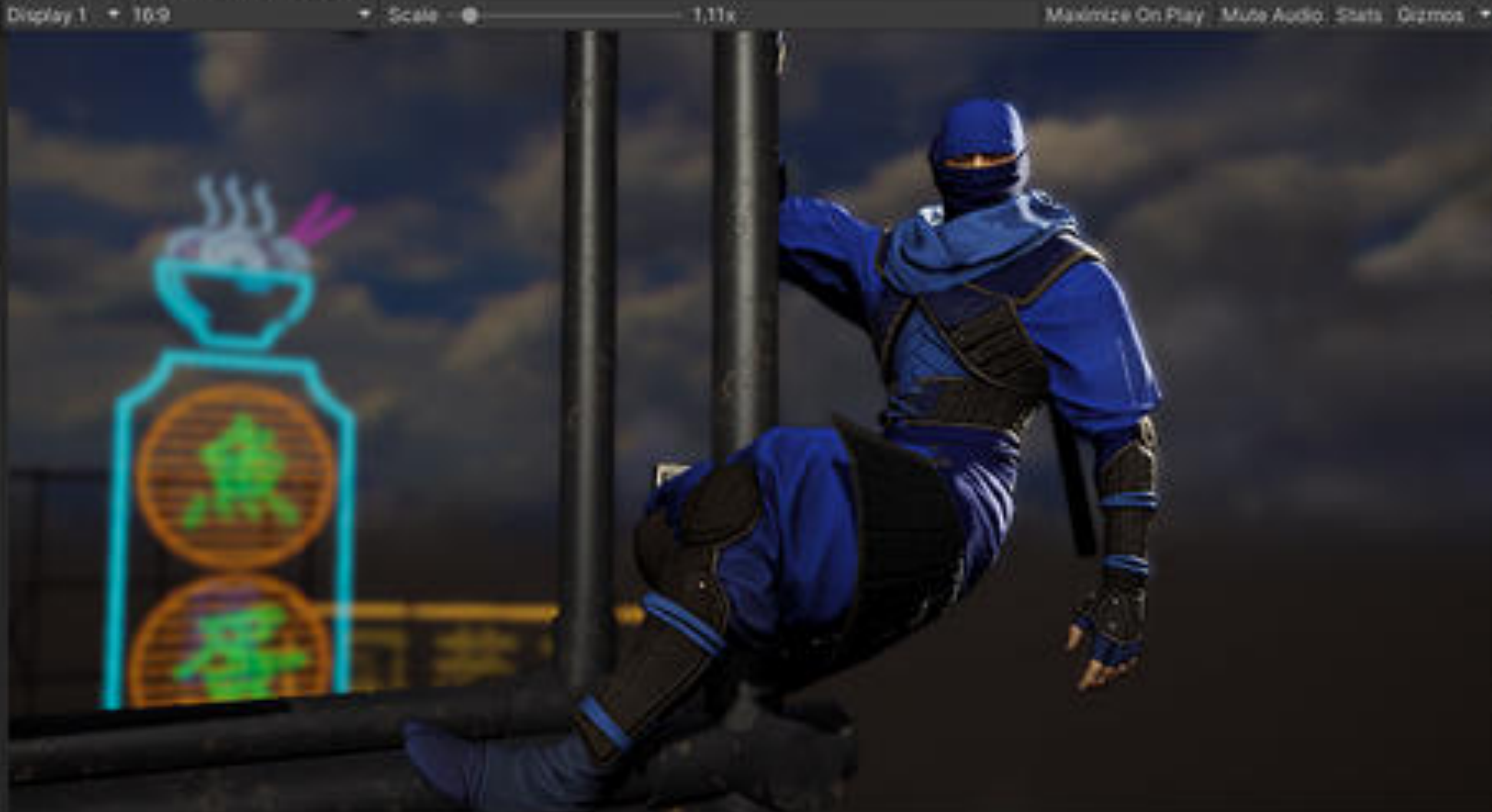


WHAT'S IN AN EDITOR



GODOT

- NinjaMegacityDemo*
 - Cameras
 - Main Camera
 - Building_Main
 - Visual_Settings
 - Ninja
 - NinjaRig_Staff
 - NinjaRig_Sword
 - NinjaRig_Ramen
 - NinjaRig_Climbing**
 - models_grp
 - cloth_grp
 - ninja_grp
 - arms_mesh
 - bandana_short_mesh
 - belt_mesh
 - boots_mesh
 - elbowpads_mesh
 - forearms_mesh
 - hands_mesh
 - head_mesh1
 - headtech_mesh
 - kneepads_mesh
 - pants_mesh
 - scarf_mesh
 - shinguards_mesh
 - torso_mesh
 - waist_mesh
 - wristguards_mesh
 - weapons_grp
 - Root



NinjaRig_Climbing Static

Tag Untagged Layer Default

Variant Open Select Overrides

Transform

Position	X 10.762	Y 333.436	Z 31.591
Rotation	X 0	Y 90	Z 0
Scale	X 1	Y 1	Z 1

Animator

Rigidbody

Mass	1
Drag	0
Angular Drag	0.05
Use Gravity	<input type="checkbox"/>
Is Kinematic	<input checked="" type="checkbox"/>
Interpolate	Interpolate
Collision Detection	Continuous Speculative

Constants

Freeze Position X Y Z

Freeze Rotation X Y Z

Capsule Collider

Edit Collider

Is Trigger

Material None (Physic Material)

Center	X 0	Y 0.9	Z 0
Radius	0.3		
Height	1.8		
Direction	Y-Axis		

Bone Renderer

Bone Renderer

Rig Builder

Add Component

- Project
 - Favorites
 - Assets
 - AnimationRigging
 - MegacityDemo
 - Building_Main
 - Decals
 - Materials
 - Textures
 - Decal_Dirt_A
 - Decal_Dirt_B
 - Decal_Dirt_Leak_A
 - Decal_Rust_A

UNITY



UNREAL

COMMON PARTS

- ▶ A scene visualisation
- ▶ A scene hierarchy
- ▶ An inspector
- ▶ A project browser

**WE ALREADY HAVE
THAT**



BEVY-INSPECTOR-EGUI

BEVY-INSPECTOR-EGUI

- ▶ A scene visualisation
- ▶ A scene hierarchy
- ▶ An inspector
- ▶ ~~A project browser~~

WHAT'S MISSING? INSPECTOR TO EDITOR

- ▶ Saving the changes made in the inspector
- ▶ Bevy is often code first, saving would mean editing rust files
- ▶ Need to transition to a scene file first workflow
- ▶ Interactivity in the scene

WHAT'S MISSING? FAST EDITOR

- ▶ Live reloading a scene
- ▶ With the correct states, existing entities and resources
- ▶ Hot reloading of rust code?
- ▶ Rust code generation?

WHAT'S MISSING? THE REST

- ▶ Project browser?
- ▶ Code editor?
- ▶ Shader editor?
- ▶ Animation editor?
- ▶ Game view / scene view split?



**BUT THE BEVY
EDITOR?**

WHAT SHOULDN'T IT DO?

- ▶ Edit rust files?
 - ▶ Use your preferred code editor!
- ▶ Edit 3d scenes?
 - ▶ Use blender!
- ▶ Edit sprites?
 - ▶ Use asesprite!

WHAT'S AN ECS EDITOR

- ▶ Extremely Common Scene editor?
- ▶ Easy and Complex Scene editor?
- ▶ Engine Controlled Scene editor?
- ▶ Extra Cool Scene editor?

WHAT'S AN ECS EDITOR

- ▶ Entities editor
 - ▶ List and browse entities
 - ▶ Run queries
 - ▶ Stats on spawn and despawn
 - ▶ List systems with a query matching an entity

WHAT'S AN ECS EDITOR

- ▶ Components editor
 - ▶ Display and edit values
 - ▶ View archetype fragmentation
 - ▶ Stats on add / remove / change
 - ▶ Change storage

WHAT'S AN ECS EDITOR

- ▶ Systems editor
 - ▶ View dependencies and conflicts
 - ▶ Stats on duration, on system params

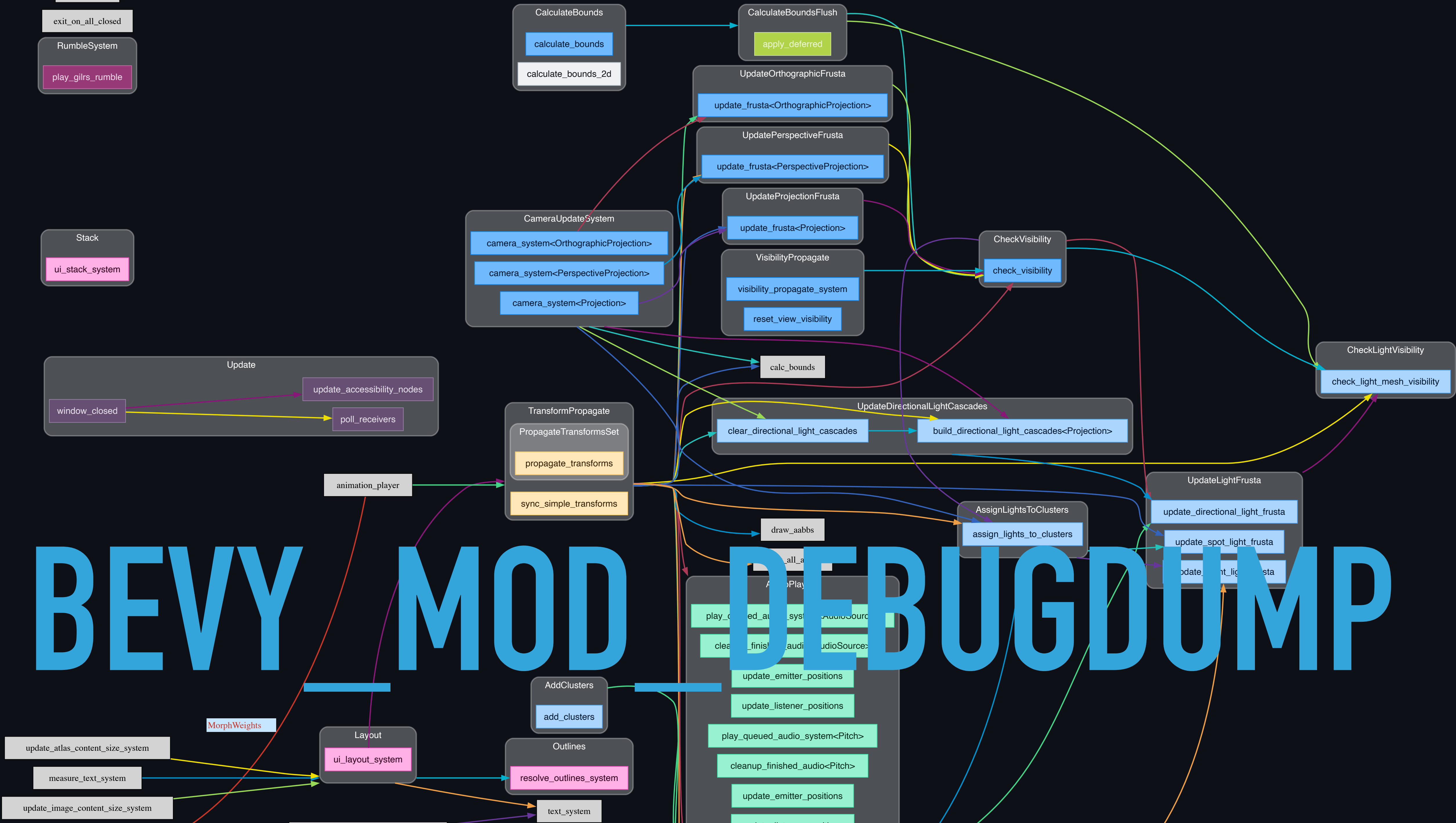
WHAT'S AN ECS EDITOR

- ▶ Commands, Events, Resources, States, Tasks
 - ▶ More stats!
 - ▶ Send commands
 - ▶ Send events
 - ▶ Modify resources
 - ▶ Change states
 - ▶ Monitor tasks

WHAT'S AN ECS EDITOR

- ▶ Show systems that interacts with audio components (queries and commands)
- ▶ Monitor task spawning and find where buildups could happen
- ▶ Find systems blocking parallelism
- ▶ Reorder commands to limit archetype fragmentation
- ▶ Enable/disable system during runtime

BEVY MOD DEBUGDUMP



FLECS EXPLORER

The screenshot displays the Flecs Explorer interface, which is used for monitoring and debugging Flecs-based applications. The interface is divided into several main sections:

- Left Panel:** A vertical stack of performance graphs for various systems. Each graph shows the time spent in that system over a selected time interval (1 second, 1 minute, 1 hour, 1 day, 1 week). The systems shown include:
 - FindWorldCell:** Time spent (26us, 1%)
 - SetWorldCell:** Time spent (32us, 1%)
 - ResetWorldCellCache:** Time spent (11us, 0%)
 - PopulateGeometry:** Time spent (353us, 10%)
 - Render:** Time spent (543us, 10%)
 - Commit:** Time spent (1us, 0%)
 - DequeueRest:** Time spent (1us, 0%)
- Center Panel:** Performance and entity monitoring graphs.
 - Entities:** Two line graphs showing the count of entities over time. The top graph is labeled "Count" and the bottom "Not alive count".
 - Performance:** A series of line graphs showing various performance metrics:
 - Fps:** Frames per second, fluctuating around 122.7.
 - Frame time:** Time spent in frame, fluctuating around 0.069.
 - System time:** Time spent on running systems, fluctuating around 0.066.
 - Rematch time:** Time spent on merging commands in frame, fluctuating around 0.006.
- Right Panel:** Entity and component details.
 - Entity List:** A table listing entities with their IDs and positions. The "turrets" entity type is highlighted, showing a list of 1025 entities with their respective positions (e.g., 1025 at -1.5, -0.25, -1.5).
 - Component Inspector:** A detailed view of the selected entity's components. It shows the hierarchy of components, including "Position3" with values x: -1.5, y: -0.25, and z: -1.5.

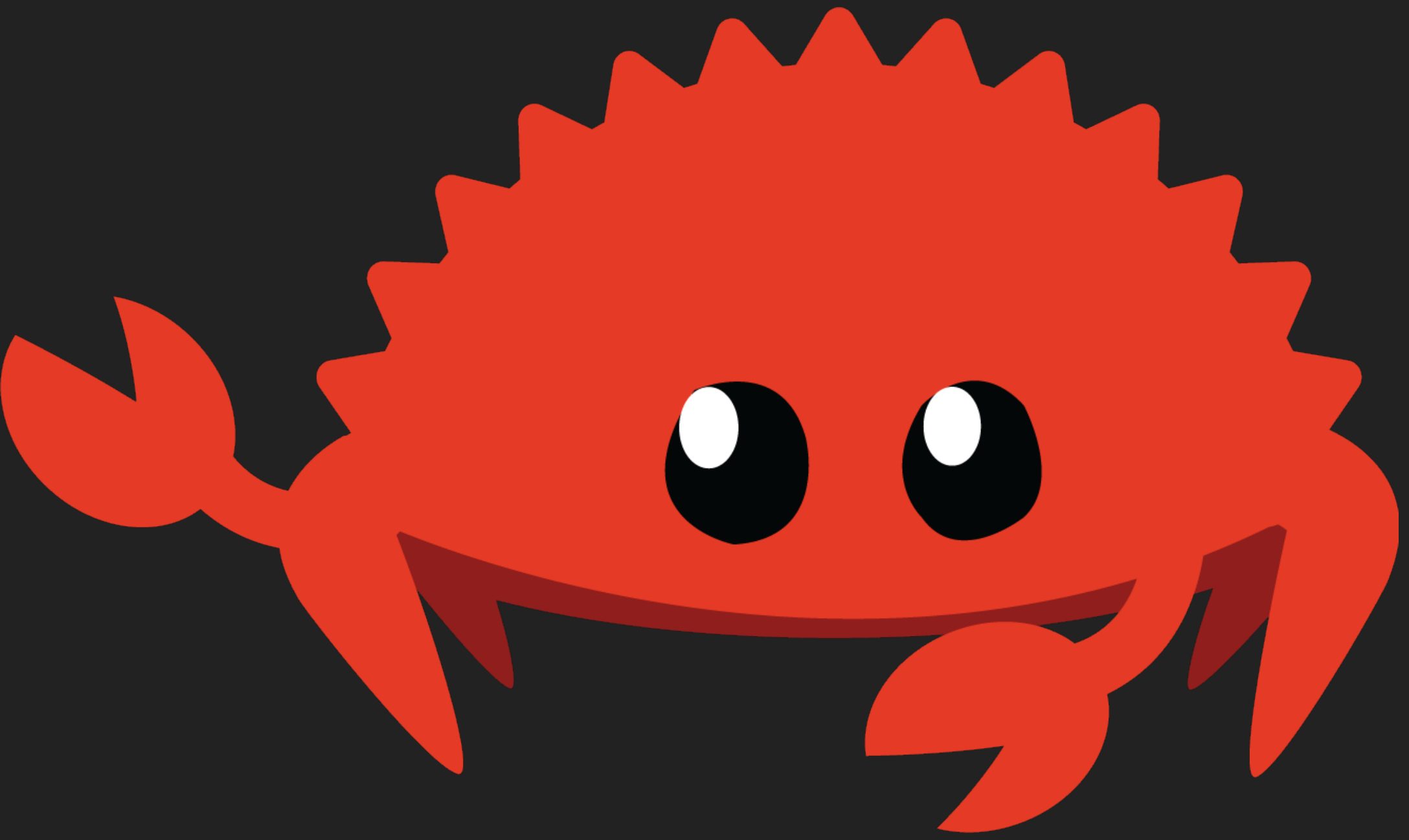
Systems	World	Namespace	Entity Count	Time (ms)
Initialization				
Update				
Simulation System Group	Default World	Unity.Entities		0.34
Begin Simulation Entity Command Buffer System	Default World	Unity.Entities		
Fixed Step Simulation System Group	Default World	Unity.Entities		
Variable Rate Simulation System Group	Default World	Unity.Entities		
Move Red Cubes	Default World	TMG.Tags		
Test System	Default World	TMG.ECS_Worlds		
Test System 2	Default World	TMG.ECS_Worlds		
Battle System	Default World	TMG.ChangeFilter		
Spawn Capsule System	Default World	TMG.ECS_UI		
New World System	Default World	TMG.ECS_Worlds		
Move Cube System	Default World	TMG.SyncPoints		
Movement System	Default World	TMG.BatchedJobs		
Spawn Grid System	Default World	TMG.SyncPoints		
Move Shot System	Default World	TMG.WriteGroups		
Apply Radiation System	Default World	TMG.ECS_UI		
Test Group A	Default World	TMG.SystemUpdat...		0.01
Test System B	Default World	TMG.SystemUpdat...		
Test System A	Default World	TMG.SystemUpdat...		
Test System C	Default World	TMG.SystemUpdat...		
Spawn Shots System	Default World	TMG.WriteGroups		
Spread Shot System	Default World	TMG.WriteGroups		
Reload Scene System	Default World	TMG.ConnectFour		
Movement System	Default World	TMG.ECS_Transfor...		
Rotation System	Default World	TMG.ECS_Transfor...		
Radiation Control System	Default World	TMG.ECS_UI		
Double Speed System	Default World	TMG.WriteGroups		
Regular Shot System	Default World	TMG.WriteGroups		

Disable Live Conversion	Tag
Disable Rendering	Tag
Disable Scene Resolve And Load	Tag
Disabled	Tag
Dots Serialization Folder Node	Data
Dots Serialization Node Header	Data
Dots Serialization Revisioned Raw Data Node	Data
Dots Serialization String Table Node	Data
Dots Serialization Type Names Node	Data
Double Shot Speed Tag	Tag
Double Speed Tag	Tag
Dummy Collider Fakes Component<Box Collider>	Tag
Dummy Collider Fakes Component<Capsule Collider>	Tag
Dummy Collider Fakes Component<Collider>	Tag
Dummy Collider Fakes Component<Compound Collider>	Tag
Dummy Collider Fakes Component<Convex Collider>	Tag
Dummy Collider Fakes Component<Cylinder Collider>	Tag
Dummy Collider Fakes Component<Mesh Collider>	Tag
Dummy Collider Fakes Component<Polygon Collider>	Tag
Dummy Collider Fakes Component<Sphere Collider>	Tag
Dummy Collider Fakes Component<Terrain Collider>	Tag
Editor Render Data	Shared
Enemy Data	Data
Enemy Health Data	Data
Enemy Health UI	Data, Managed
Enemy Health UI	Data, Managed
Entity	Entity
Entity Guid	Data

Archetypes	Allocated	Unused
All	288 KB	277.4 KB
Default World	240 KB	231.1 KB
Archetype c0490c3a4cae66e7	32 KB	31.2 KB
Archetype 637ae4499826a4d4	16 KB	15.9 KB
Archetype 47e0384410cd9ad4	16 KB	15.8 KB
Archetype 90a2b7f330000000	16 KB	15.9 KB
Archetype b590b15e00000000	16 KB	15.9 KB
Archetype 4720caed00000000	16 KB	15.9 KB
Archetype 81505ea400000000	16 KB	15.9 KB
Archetype f850b25c00000000	16 KB	15.6 KB
Archetype 7b30ecff0d8d0382	16 KB	15.3 KB
Archetype 3f00b21400000000	16 KB	15.9 KB
Archetype 6f00b85f40000000	16 KB	15.9 KB
Archetype 67b0000000000000	16 KB	15.9 KB
Archetype 0516087000000000	16 KB	14.1 KB
Archetype 70f9e87ffc5a4352	16 KB	13.8 KB
Converted Scene: 'TestSubScene'	32 KB	31.1 KB
Archetype 47e0384410cd9ad4	16 KB	15.8 KB
Archetype 7b30ecff0d8d0382	16 KB	15.3 KB
Converted Scene: 'TestSubScene' (Shadow)	16 KB	15.3 KB
Archetype 7b30ecff0d8d0382	16 KB	15.3 KB

Inspector	Inspector	Project Settings
Track Shader Reflection Changes System		
Queries Relationships		
Entity	Read & Write	
ChunkWorldRenderBounds	Read	
WorldRenderBounds	Read	
WorldRenderBounds	Read	

UNITY DOTS



**THERE ARE GREAT
TOOLS OUT THERE**

SCENE EDITOR

- ▶ Generalist

- ▶ Blender <https://www.blender.org/>

- ▶ LDtk <https://ldtk.io/>

- ▶ Specialised

- ▶ TrenchBroom <https://trenchbroom.github.io/>

- ▶ World Machine <http://www.world-machine.com/>

- ▶ And many more

IMAGES

- ▶ Aseprite <https://www.aseprite.org/>
- ▶ Inkscape <https://inkscape.org/>
- ▶ Krita <https://krita.org/>
- ▶ And many more

2D ANIMATIONS

- ▶ Rive <https://rive.app/>
- ▶ Spine <https://esotericsoftware.com/>
- ▶ And many more

STORYTELLING

- ▶ Yarn Spinner <https://www.yarnspinner.dev/>
- ▶ And many more

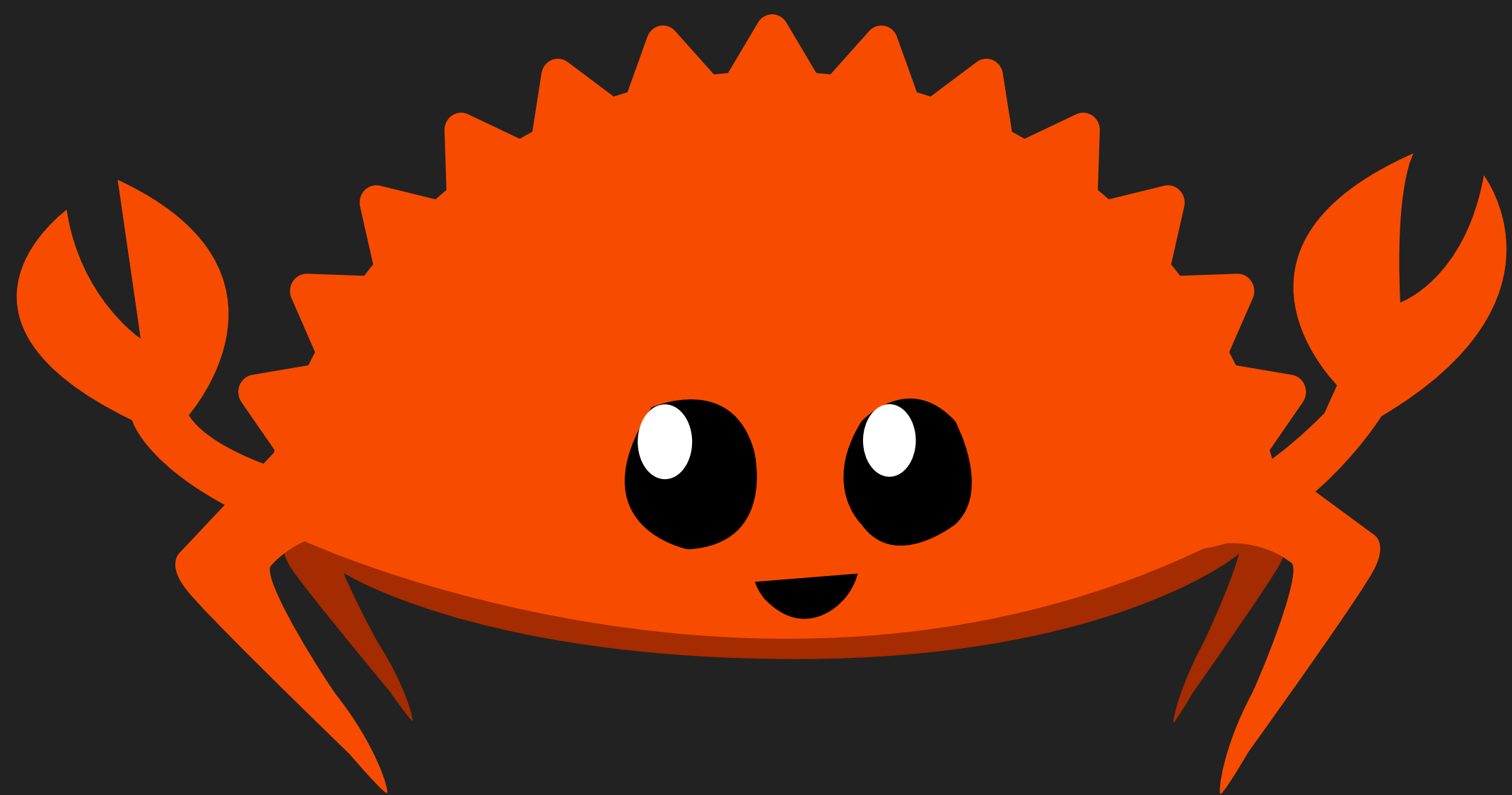
SOUND EFFECTS

- ▶ Audacity <https://www.audacityteam.org/>
- ▶ ChipTone <https://sfbgames.itch.io/chiptone>
- ▶ jsfxr <https://sfxr.me/>
- ▶ And many more

CODE EDITOR

▶ ...

▶ And many more



CLOSING THOUGHTS

CLOSING THOUGHTS

- ▶ A scene editor doesn't make sense until we have a scene-first workflow
 - ▶ But designing its UI now is fun!
 - ▶ And it's high impact as it's the first thing newcomers will see for Bevy 1.0
- ▶ But it's boring **to me** as it's reproducing what everyone else is doing
- ▶ We could try to explore what makes Bevy unique instead
- ▶ There are also a lot of low hanging fruits around project creation, feature selection, asset management that could be addressed now and bring a lot of value to the project

CLOSING THOUGHTS

- ▶ Look at the prototypes
- ▶ https://github.com/bevyengine/bevy_editor_prototypes/discussions/1
- ▶ Create your own!

- ▶ Have fun!
- ▶ Open source burnout is real, don't put pressure on yourself, take care of yourself