Glyn Leine

Almelo | glynleine.com/ | linkedin.com/in/glyn-leine | [redacted] | [redacted]

Profile

I am a passionate game and engine developer specialized in **C++** and computer **graphics**. I get excited by designing systems, handling asynchronous processes, and handling **team coordination** with fellow programmers. I've designed and developed several engines in **C++** as both a professional and a hobbyist. Although no-one can really know everything about **C++**, I keep up to date with every new standard and enjoy learning more every day. As I've gotten into engine development I've gained substantial experience with using **OpenGL**, **WebGL**, **Direct3D 11**, and various **DX12/VK based api abstractions**.

Professional Experience

Full-time Engine Programmer (Remote) Bright Star Studios (Sep 2022 – Jan 2023 – Present)
Ember Sword - **Custom C++ engine**, WebGL, Web Assembly Multiplatform

At Bright Star Studios I've worked on various systems throughout the entire proprietary engine. Especially at the start when the team on engine & editor was **just me and my lead**. Back then I expanded and maintained the **asset import** pipeline, and I designed and set up the **initial editor architecture** for introspection, scene/prefab editing, and long running processes with modals using **coroutines**. During my entire time at Bright Star working on various tasks I expanded and maintained the custom **DearImGui** front-end I created early on at Bright Star. On the game side I cleaned up a lot of shader work and unified **lighting** across many **shaders**, and introduced energy conservation while still adhering to the artistic vision set for Ember Sword, and significantly improved various **post-processing effects** and **shadow mapping**. In my first year, I also became one of the first maintainers of the **reflection system** expanding it and maintaining it until the team grew. Due to the self-sufficient work I delivered on all of these areas of the engine, I was **promoted** from junior to mid-level within the **first 4 months**.

In my second year at Bright Star **the team was expanded**. This allowed me to take a more focussed role. I worked closely with other graphics programmers, and with the gameplay artists and gameplay programmers to make new tools and polish existing tools to suit their workflows. I **coordinated** and worked on the **character system**. Which incorporated the editor tooling, asset processing, serialization, runtime character management, and rendering of the characters. The **design was led by me**, helped by 2 programmers (engine & gameplay) and an artist. I **coordinated the 4 of us** through the whole process from **feature request to release**. After release I continued to **support** the system and I **documented** the usage and best practices of the system and wrote some small tutorials on how to get started. The character system was a great success and a major aspect of Ember Sword. I **coordinated** similar efforts on the **socket system**, the **model editor**, and the **in-game map system**.

Graduate Intern C++ Programmer (Remote) Studio 397 (Sep 2021 – Aug 2022)
rFactor2 - **Custom C++ engine**, Direct3D11, Steam Windows

At Studio 397, under Motorsport Games, I worked on their proprietary **graphics** engine using **Direct3D 11**. Within the **small team**, I worked on various projects with only my lead as guidance. Within the first half of my stint I mostly worked on **particles**, refreshing the existing effects and the **rendering** there-of. And also adding the new effect of sparks. For this new effect I delved into real-time approximations of **over- and under-car aerodynamics**, and using **SIMD** to speed up calculations.

In the second half, I worked on R&D projects in **foliage rendering**. With some minor guidance from my lead, I **designed, implemented, and tested** the foliage system. The entire system was based on dynamically generated foliage in order to reduce the load on our already busy and small art team. In order to handle these heavy tasks without slowing down the game, the system heavily relied on **threading**, and **asynchronous GPU communication**. For this project, besides the initial direction with the requirements, I was mostly left to do my own thing.

During my entire time working at Studio 397, I spent a lot of time looking at optimizations of hot paths. A lot of my **optimizations** came from **removing costly branching**, and re-organizing sections to be **more cache friendly**.

Hobbyist Experience

Hobbyist Maintainer/Core Developer Rythe Interactive (July 2020 – Present)
Rythe Engine - **Custom C++ engine**, OpenGL, Windows/Linux

Rythe Engine is a game engine that I develop in my **spare time** with some friends. It is the result of many engines I've written in the past and restarted. And inevitably this engine now has several revisions too.

In a 6 month effort to kickstart the project, **I led a team of 8** programmers to develop the first revision of this engine. I personally **designed almost the entire engine** and wrote the **ECS**, **scheduling/threading**, event-based input system, asset-processing including a **custom GLTF/GLB importer/exporter** and optimizer, and graphics module with the **scriptable render pipeline**, **physically based shading**, **image based lighting**, POM, and several post-processing effects such as bloom, depth-of-field, SSAO, auto-exposure, and tonemapping. I also worked on the implementations of our **spatial audio engine** using **OpenAL** and our compute stack using **OpenCL**.

This has since been an ongoing project used for personal research. I have moved it to use **C++23** with a **custom STL replacement** and a custom **templated SIMD math library**. In this later revision I also wrote a revised build-system using **Premake** that separates all parts of the engine in sub-modules. This version also features revised scheduling, and **dynamic plugins/modules** and will switch to **Vulkan** instead of **OpenGL**.

Additional Experience

Teaching and Mentoring – I've organized masterclasses in several topics such as **understanding hardware and compilers** for about 2 years after graduation. I've also taught several classes on **C++**, **3D math**, and **3D rendering** to students at the Saxion University of Applied Sciences. All prior mentioned events occurred both in paid and unpaid capacities.

Game Jams – I'm an **avid game jammer**, attending on average about **4-5 game jams per year**. For most of these I use **Unity**, but some were done using **Unreal**, or the **Rythe Engine**. I've been **in charge of programming and technical art** for almost all jams, with team sizes varying from **3 to 12 people**. I enjoy testing my skills as both a developer and as a **lead** during these jams, figuring out the minimum requirements and the optimal ways to get them **done within the time** and resources available.

Other technologies I'm familiar with – C#, Git, Perforce, Plastic, Jira, Lua, Python, Java, Premake, LaTeX, Unity (including URP, HDRP, DOTS), Unreal 4, Blender (including scripting), GLTF/GLB, Draco, ImGui, OpenAL, OpenCL, GLFW, GLM, ENTT, BGFX, spdlog, Tracy

Education

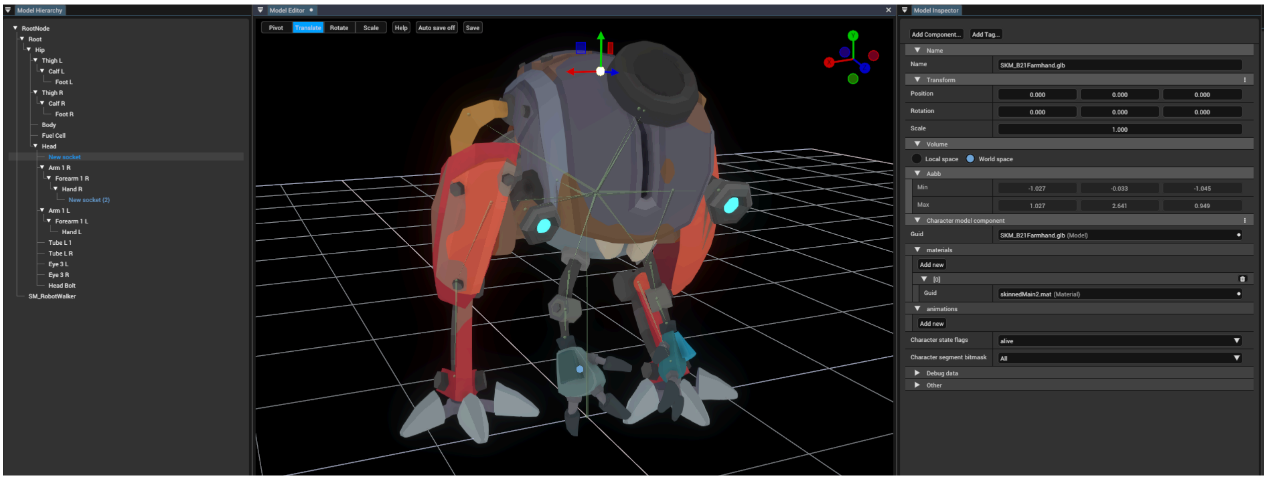
Saxion University of Applied Sciences Enschede (2018 – 2022)
Bachelor of Applied Science - BASc, Game architecture and design / Game Programmer

NHTV International University of Applied Sciences Breda (2017 – 2018)
Bachelor of Applied Science - BASc, Computer games and programming

Languages

English Bilingual
Dutch Native

Images



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  Root
    Hip
      Thigh L
        Calf L
          Foot L
      Thigh R
        Calf R
          Foot R
      Body
      Fuel Cell
      Head
        New socket
        Arm 1 R
          Forearm 1 R
            Hand R
              New socket (2)
        Arm 1 L
          Forearm 1 L
            Hand L
        Tube L 1
        Tube L R
        Eye 3 L
        Eye 3 R
        Head Bolt
  SM_RobotWalker
```

Name

Name: SKM_B21Farmhand.glb

Transform

Position: 0.000 0.000 0.000

Rotation: 0.000 0.000 0.000

Scale: 1.000

Volume

○ Local space ● World space

Aabb

Min: -1.027 -0.033 -1.045

Max: 1.027 2.641 0.949

Character model component

Guid: SKM_B21Farmhand.glb (Model)

materials

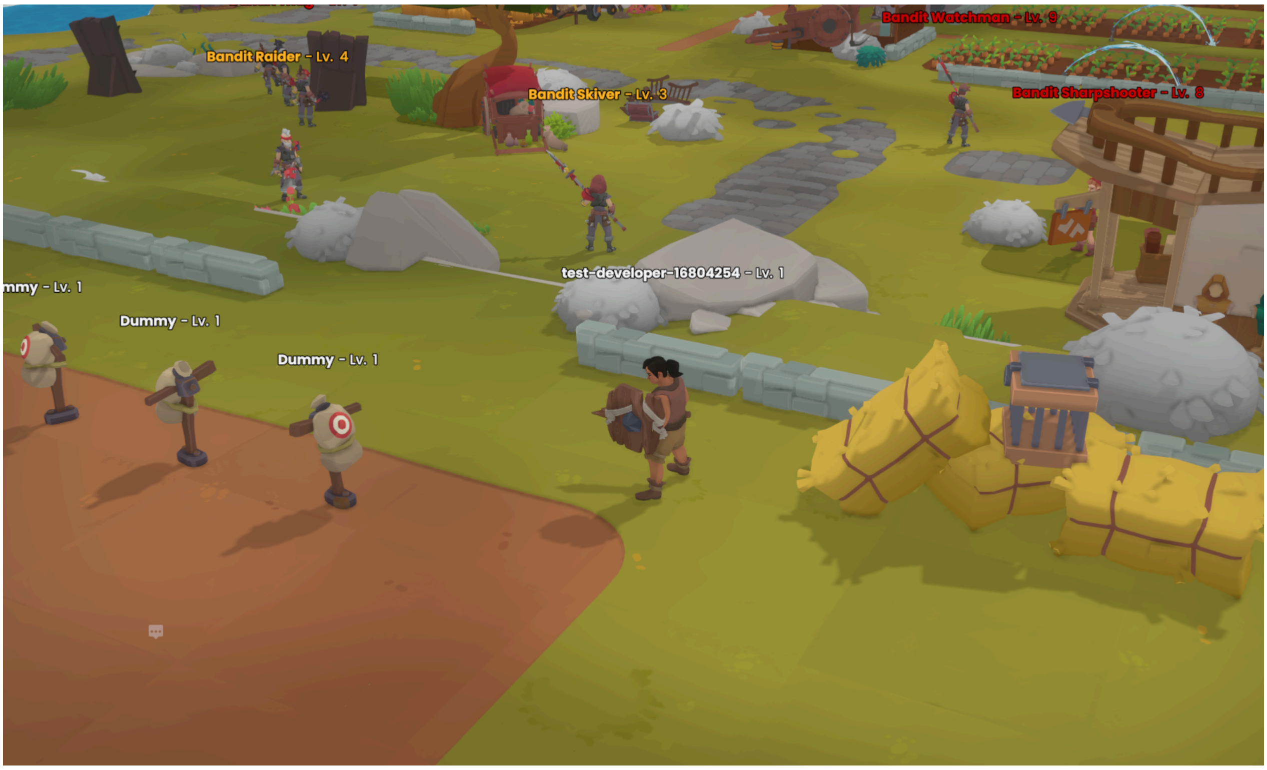
[0]

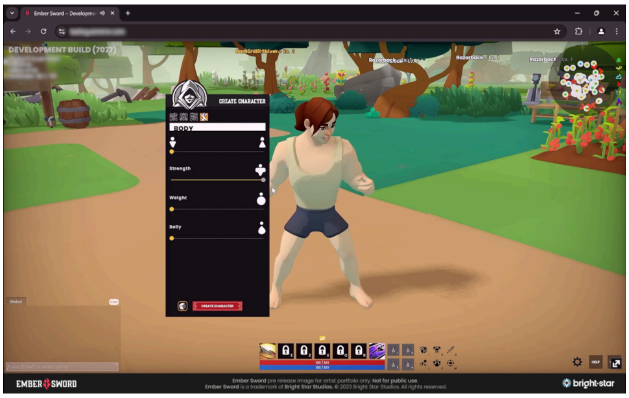
Guid: skinnedMain2.mat (Material)

animations

Character state flags: alive

Character segment bitmask: All





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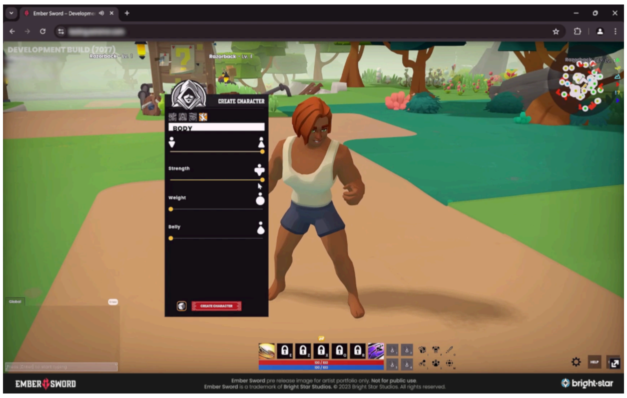

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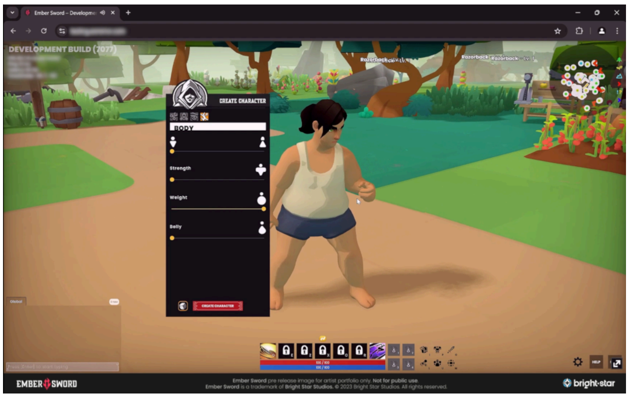

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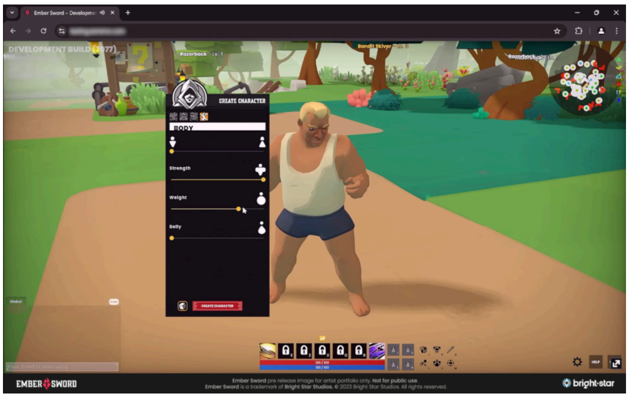

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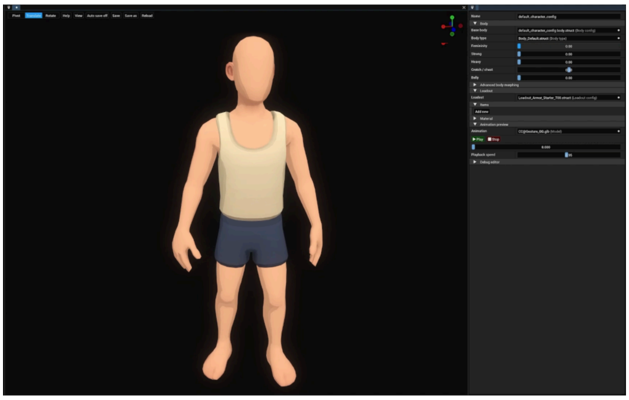

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▼ Body	
Base body	default_character_config body.struct (Body config)
Body type	Body_Default.struct (Body type)
Femininity	0.00
Streng	0.00
Heavy	0.00
Crotch / chest	0.50
Belly	0.00
▶ Advanced body morphing	
▼ Loadout	
Loadout	Loadout_Armor_Starter_T00.struct (Loadout config)
▼ Items	
▶ Material	
▼ Animation preview	
Animation	CC@Gesture_GG.glb (Model)
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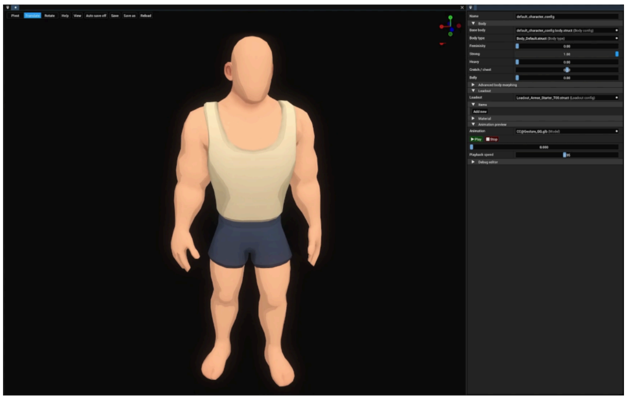
Playback speed	0.95
▶ Debug editor	



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Streng	1.00
Heavy	0.00
Crotch / chest	0.50
Belly	0.00
▶ Advanced body morphing	
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▼ Items	
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▼ Animation preview	
Animation	CC@Gesture_GG.glb (Model)
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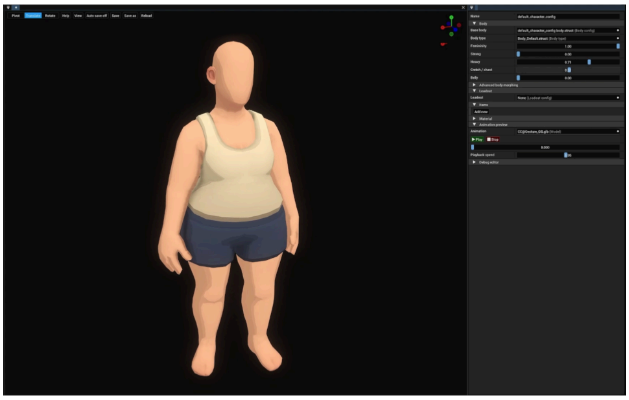
Playback speed	0.95
▶ Debug editor	



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Streng	0.00
Heavy	0.71
Crotch / chest	0.50
Belly	0.00
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▼ Loadout	
Loadout	None (Loadout config)
▼ Items	
▶ Material	
▼ Animation preview	
Animation	CC@Gesture_GG.glb (Model)
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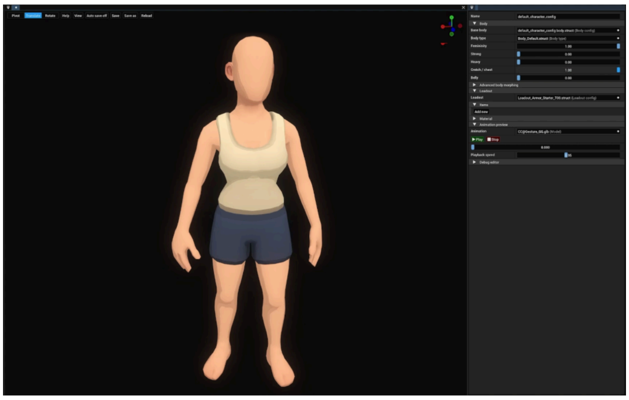
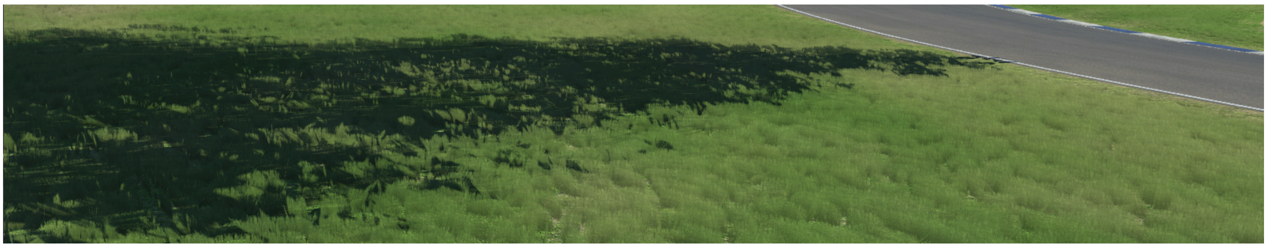
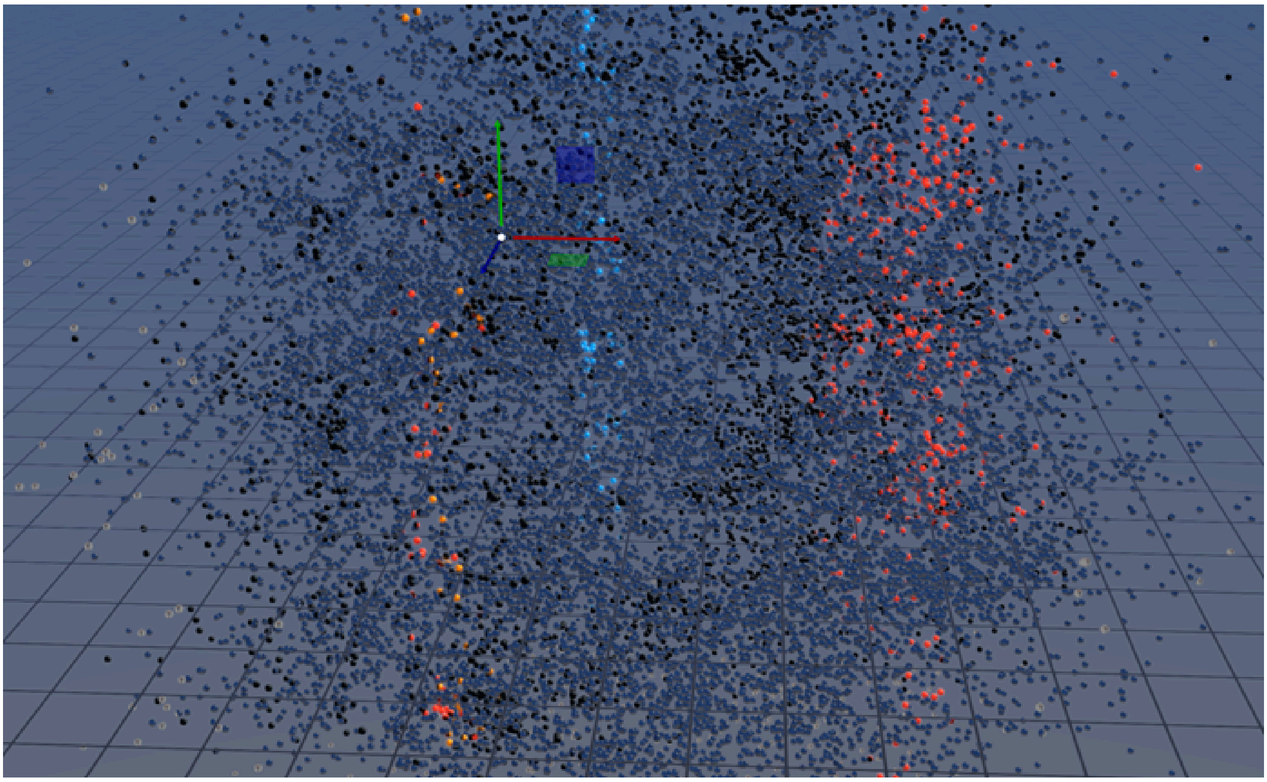
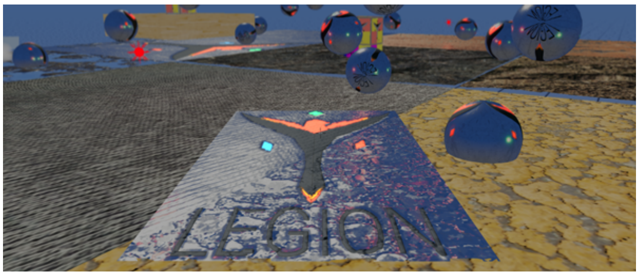
Playback speed	0.95
▶ Debug editor	



Name	default_character_config
▼ Body	
Base body	default_character_config body.struct (Body config)
Body type	Body_Default.struct (Body type)
Femininity	1.00
Streng	0.00
Heavy	0.00
Crotch / chest	1.00
Belly	0.00
▶ Advanced body morphing	
▼ Loadout	
Loadout	Loadout_Armor_Starter_T00.struct (Loadout config)
▼ Items	
▶ Material	
▼ Animation preview	
Animation	CC@Gesture_GG.glb (Model)
	0.000
Playback speed	0.95
▶ Debug editor	







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