Interoperable Characters/Avatars (Humanoids & Non-Humanoids)
Domain Exploratory Group Proposal

1. Proposers

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2. Exploratory Group Scope

Build consensus and draft a proposed charter for an Interoperable Characters/Avatars (Humanoids & Non-Humanoids) Domain Working Group.

3. Proposed Working Group Goals (and Non-Goals), Initiatives, and Deliverables

The proposed charter would set out goals and key activities to generate insights into leading interoperable character/avatar initiatives, evaluate prioritized use cases across multiple industries and platforms, and identify opportunities to enhance and enable character/avatar interoperability.

Special attention would be paid to opportunities for cooperation between existing initiatives to increase synergy and reduce duplication of effort, gaps, fragmentation and confusion, for the good of the industry.

3.1 Investigations

- Identify and prioritize use cases for character/avatar interoperability across multiple industries such as film, gaming, fashion and social, and platforms such as web, mobile, console, and XR.
- Explore existing character/avatar initiatives and standards developing organizations (SDOs) who may be interested in cooperation over character/avatar interoperability.

3.2 Requirements and Key Criteria

An ideal standardized character/avatar file format should be able to be authored to be dynamically loaded in one virtual world hosted on one platform—and then seamlessly used in another world, hosted on another platform, while maintaining consistent appearance, behaviors and animations.

Such a character might be controlled by a user, from engine code, or from a third-party system and is not necessarily humanoid in scale or appearance.

Defining such a standardized character could include:

Standard terminology and taxonomy. A consistent cross-vendor character terminology based on existing best practice.

Standard Orientation. Consistent facing of the character mesh and bones relative to the normal frame.

Standard Default Posing*.* Standard posing for humanoids and non humanoids. Comparison will be made with previous industry standard poses such as T Pose, and A Pose for humanoids.

Standard Bone Names & Skeleton Topology Animations*.* Standard ways to link animations including partial animations, animation blending, etc.

Socket Names. Standardized sockets available in all characters for wearable attachment or a gameplay trigger. These "attachment points" define the position, orientation, etc for attachments such as wearables, weapons, etc.

Facial Expression Data. A baseline bone set on the face to facilitate character expressions, such as expressed by visemes, lip flapping, other facial animations, morph targets, etc.

Material/Texture Names. Material/Texture embedding name styles.

Eye Height/Spread. Standardized methods for determining eye height and spread, important for VR first-person applications, where the user is "looking out" from inside the model.

Height of the Character. Standardized representation of character height.

Metadata. Insertion points for data segments into the character file, covering extensions and vendor supported data within the common format.

Physics Data. Chains for attachments and bones, such as ponytails, clothing or soft-body physics for use by a physics engine.

Constraints. Representation of skeletal constraints for character animation systems using sparse inputs such as HMD/controller/hand pose, motion tracking data or cameras, using elements from a spectrum of trained models, physics simulations, real-world positions, extracted camera data and/or inverse kinematics..

Graceful Degradation. Handling of HMDs with unequal capabilities (e.g. lacking of leg/feet sensors showing half avatars should ensure that cut-off happens at right positions, eye tracking, controllers with touch/nudge sensors, etc), LODs, higher/lower triangle counts between avatars (i.e. Progressive 3D meshes).

3.3 Projects
- Define the parameters and structure for metadata to describe the character, and related usage specifications.
- Prototype an open source example import library that can load a standardized character (leveraging existing implementation work if possible).
- Prototype character/avatar build time and run time interoperability across different worlds and engines (including web and native rendering engines).

4. Coordination

This Domain Group would aim to collaborate with and complement existing interoperable character/avatar solutions—including relevant standardization initiatives such as:
- Metaverse Standards Forum: 3D Asset Interoperability Working Group
- Metaverse Standards Forum: Digital Fashion Wearables for Avatars
- Open Metaverse Interoperability Group (W3C Community Group)
- The VRM Consortium
- Khronos 3D Formats Working Group (for glTF)
- Web3D Consortium (for HAnim)
- IEEE P3141 (for 3D Body Processing)

The Domain Group would also outreach to vendors including character/avatar creators, 3D game engines, and production studios such as:
- Unreal Engine (Epic Games)
- Unity
- PlayCanvas
- ThreeJS
- BabylonJS
- GoDot
- Microsoft (including Minecraft)
- Roblox
- Meta
- ZEPETO
- Union Avatars
- ReadyPlayerMe/Wolf3D
- Gaming Companies (EA, Rockstar, Ubisoft, 2k etc.)
- Virtual World Platforms (AltspaceVR, The Sandbox, Decentraland, Somnium Space, Second Life etc.)

And other organizations and initiatives identified during the Exploratory Group phase.

5. Risk Factors & Mitigations
- Lack of funding for prototyping and testing
- Lack of contributions to/adoption by larger industry players

6. Target timeline to create proposed Working Group charter
10 Weeks

7. Additional Contributors
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8. References
[Forum Topic Brainstorm Sheet](), Avatars and Apparels section