MistIllum Description

MistTrackerVulkan.js

Purpose:
This is the **core logic and data engine** for the MistTracker solution.

- Manages all data structures (lines, items, locations, sessions, etc.).
- Handles CRUD operations with the database (MySQL).
- Provides session and state management.
- Implements advanced navigation, selection, and rendering logic (including nD geometry and projection).
- Supports integration with X11/Vulkan for high-performance visualization.
- Exposes all core APIs for use by UI, physics, and multi-user modules.

MistIllum.js

Purpose:
This is the **client shell and advanced rendering/audio/UI module** for MistTracker.

- Provides tiling, multi-monitor, and overlay support for the viewport.
- Implements lighting, global illumination, and advanced rendering (e.g., world warping, wireframes, rasterization).
- Handles audio and soundscape features.
- Offers settings, menus, and system checks for dependencies.
- Integrates with MistTrackerVulkan.js (core) and optionally MistMulti.js (multi-user).
- Contains a physics engine interface and metric tensor logic for nD/3D/4D physics, compatible with the core.

MistMulti.js

Purpose:
This is the **multi-user, peer-to-peer (P2P), and real-time collaboration module**.

- Manages user sessions, presence, and authentication.
- Handles host announcement and peer discovery (DHT/torrent-inspired).
- Implements secure communication (encryption, signing).
- Provides real-time event handling and state synchronization between users.
- Ensures rate limiting and user presence tracking.
- Keeps physics and core state in sync across all peers for collaborative sessions.

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pureMathPhysicsEngine.js **(referenced, not shown in full)**

Purpose:
This is a **theoretical and mathematical foundation** for the physics and metric tensor logic used in MistIllum.js and MistTrackerVulkan.js.

- Provides formulas and tensor structures for relativistic and nD physics.

- Serves as a reference for implementing metric-based orientation, navigation, rendering, and collision logic.

How They Work Together

- MistTrackerVulkan.js is the core: all data, state, and logic live here.
- MistIllum.js is the client shell: it provides advanced UI, rendering, audio, and physics, using the core APIs.
- MistMulti.js is the optional multi-user layer: it enables real-time, P2P collaboration and keeps all clients in sync.
- pureMathPhysicsEngine.js is the math/physics reference: its concepts are implemented in the physics and metric logic of the other modules.

In summary:

- **MistTrackerVulkan.js:** Core data and logic engine
- **MistIllum.js:** Client shell for UI, rendering, audio, and physics
- **MistMulti.js:** Multi-user, P2P, and real-time collaboration
- **pureMathPhysicsEngine.js:** Mathematical/physics foundation for metric and physics logic