

# SURYA P M

Junior Graphics and Game Engine Developer

**Rendering – WebGPU – WebGL – Asset Pipeline**

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Portfolio: [suryapm-port-folio.vercel.app](https://suryapm-port-folio.vercel.app)

## Professional Summary

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Junior graphics and game engine developer with hands-on experience working on real-time rendering systems using **WebGPU** and **WebGL**. Strong understanding of **engine architecture**, **asset pipelines**, and **GPU-driven rendering workflows**. Experienced in debugging rendering issues related to **geometry**, **buffers**, and **textures**, with a focus on clean and performance-aware engine design.

## Role and Responsibilities

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- Own and support real-time **rendering components** within a **custom engine** environment.
- Work closely with **asset pipelines** to ensure correct integration of **3D models** and **textures**.
- Analyze and debug rendering issues across **GPU pipelines** and engine systems.
- Collaborate with team members on **rendering architecture** and engine design decisions.
- Maintain clean, modular, and maintainable code aligned with **engine best practices**.

## Technical Skills

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### Graphics and Rendering

- **WebGPU** (primary) and **WebGL2** for real-time rendering
- **GPU pipeline** concepts, **shaders**, render passes, and draw submission
- Depth testing, **framebuffer** usage, and basic post-processing
- Lighting models including **Phong** and **Blinn-Phong** with gamma correction

### Engine and Systems

- **Scene graph** systems and transform hierarchies
- **Render loop** implementation and frame lifecycle management
- **Resource** and **asset management** for real-time engines
- Runtime debugging using FPS, draw calls, and validation errors

## 3D Assets and Pipeline

- **glTF 2.0** asset structure including buffers, accessors, and node hierarchies
- **Blender** UV workflows and **texture baking**
- **PBR texture integration** (Albedo, Normal, AO, Roughness)
- **Blender CLI automation** using Python for asset processing

## Programming

- **JavaScript, TypeScript**
- **TypedArrays** and memory-oriented data handling
- Modular, **engine-friendly code** structure

## Tools

- Git, Blender, VS Code, Chrome DevTools

## Experience

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### Software Developer

*Hexrfactory Immersive Tech Pvt Ltd*

*2023 - Present*

- Implemented rendering features using **WebGPU** and **WebGL**, including **buffer setup**, draw calls, and **render pass configuration**.
- Developed and refined **asset loading workflows** for **glTF-based** 3D scenes.
- Integrated **Blender-exported assets** and **baked textures** into real-time rendering pipelines.
- Debugged and resolved issues related to **transforms**, **buffer layouts**, **textures**, and **shader inputs**.
- Supported **texture baking** and asset preparation workflows for **PBR-based rendering**.
- Contributed to improvements in **engine structure** and **rendering stability**.

## Graphics and Engine Knowledge

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- **Model-View-Projection (MVP)** pipeline
- **Normal matrix** and inverse transpose concepts
- **CPU and GPU responsibility separation**
- Draw call cost and **rendering performance** considerations
- **GPU memory** and buffer layout fundamentals

## Education

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### Bachelor of Science in Mathematics (B.Sc. Mathematics)

Kamaraj College, Manonmaniam Sundaranar University - 2020