Lumo Playground

Interactive 3D Web Application with Gesture Control

(Department of Computer Science & Engineering)

Project-II: BTCS-703-18

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Problem Statement

Introduction

- Traditional 3D software depends on:
- Keyboard shortcuts
- Mouse & toolbar controls
- These methods are complex and have a steep learning curve.
- Most solutions require desktop installation, reducing accessibility.

1 Lumo–Playground is an interactive 3D web application.
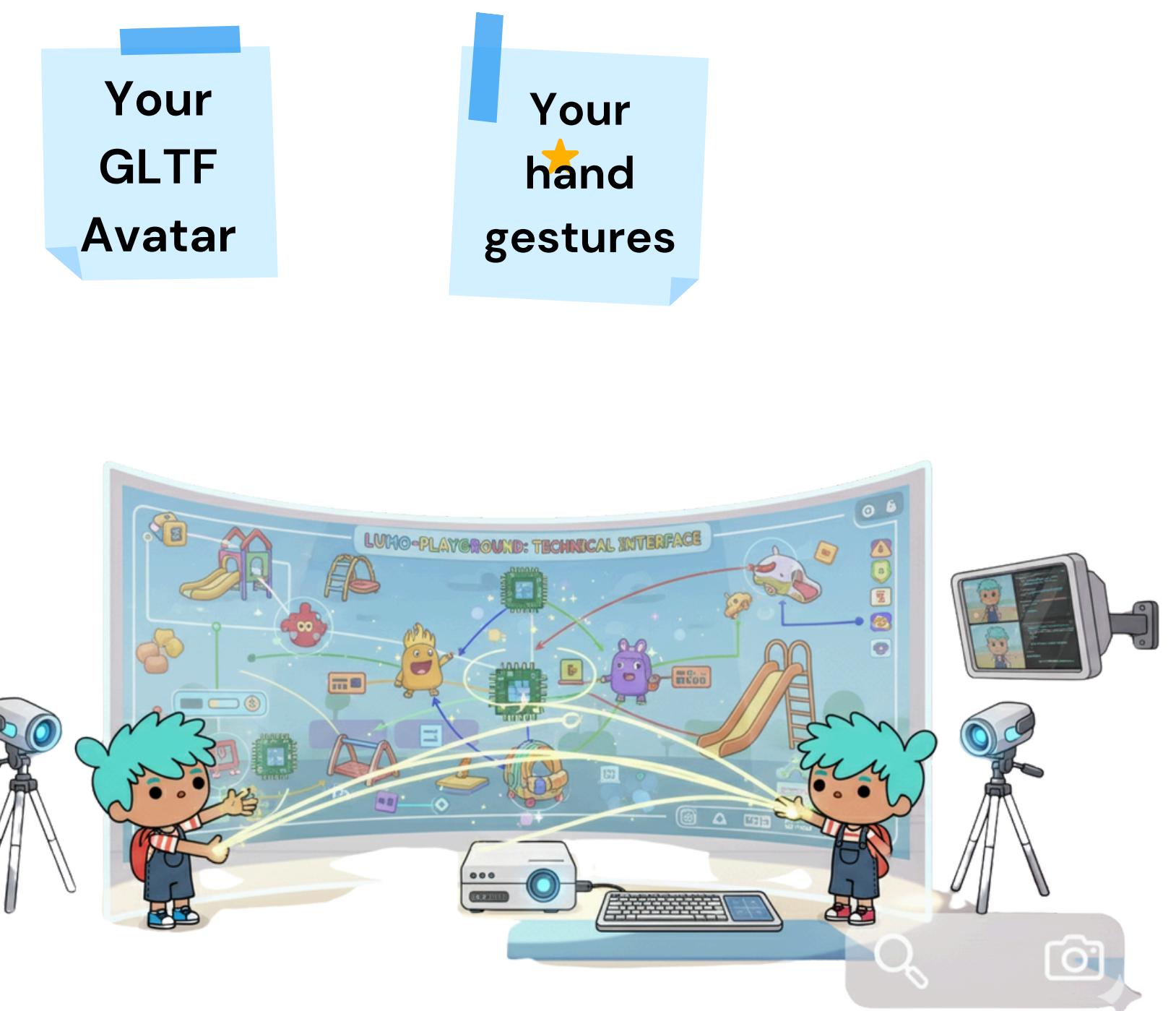
2 Integrates computer vision + 3D graphics for natural, immersive interaction.

3 Manipulate 3D models using hand gestures in real time.

Objectives / Scope

- Build an intuitive gesture–controlled 3D interface.
- Allow hands–free 3D model interaction via browser.
- Integrate voice commands for easy mode switching.
- Ensure cross-platform accessibility with no software install.
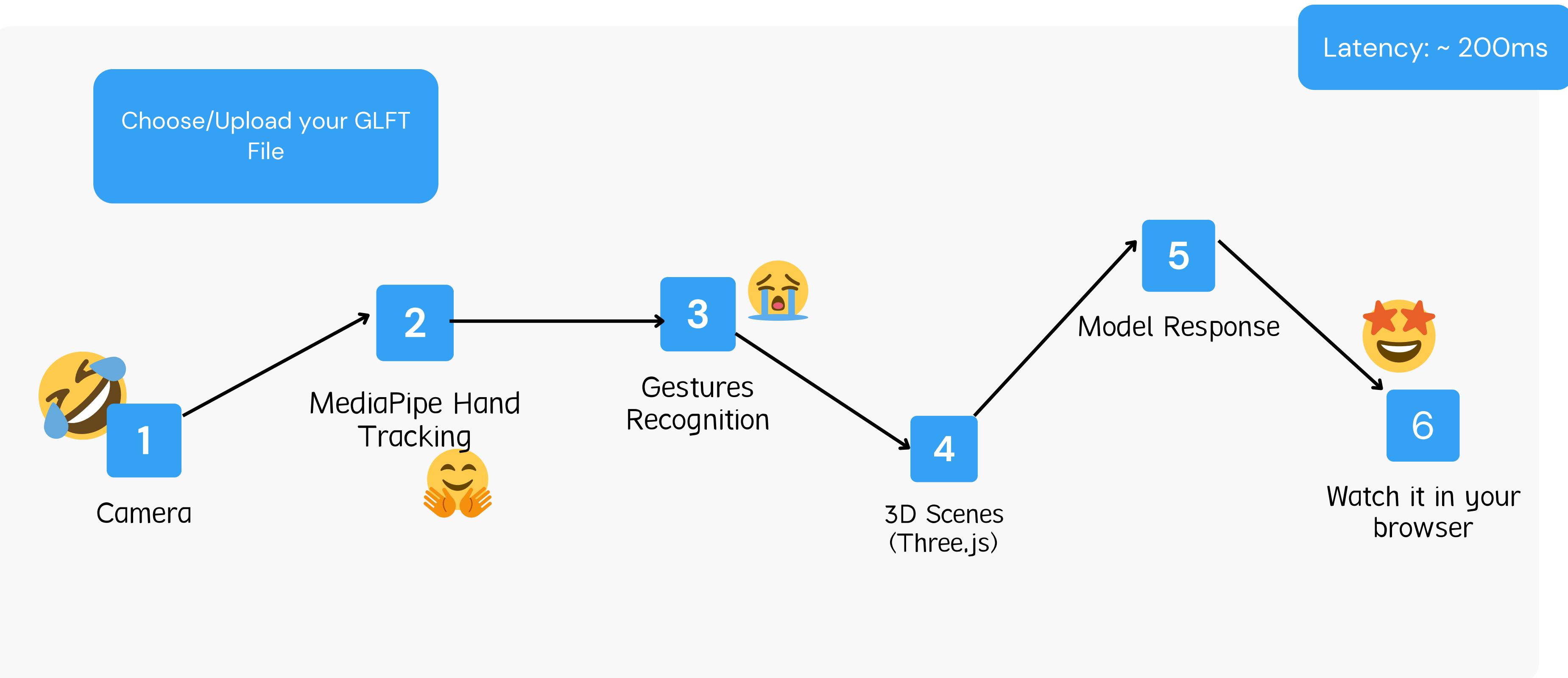
Your GLTF Avatar

Your hand gestures
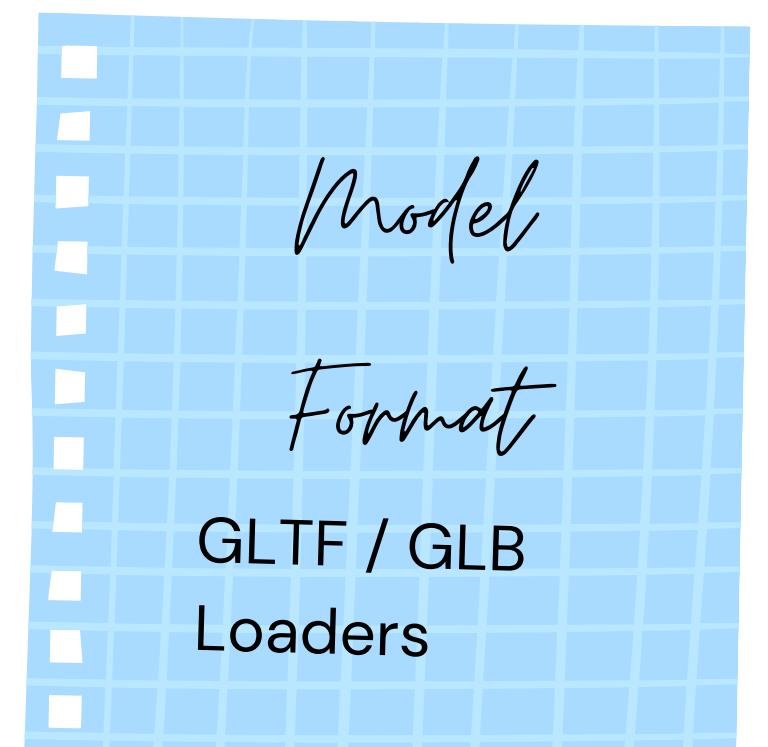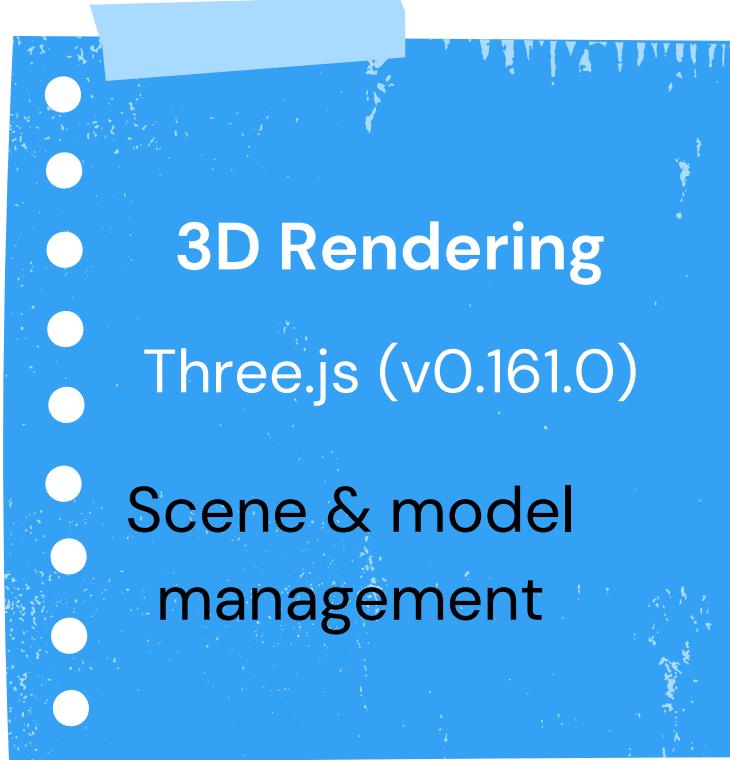
System Architecture

Lumo Playground

Latency: ~ 200ms

Choose/Upload your GLFT File

1 Camera

2 MediaPipe Hand Tracking

3 Gestures Recognition

4 3D Scenes (Three.js)

5 Model Response

6 Watch it in your browser

Technologies

3D Rendering

Three.js (v0.161.0)

Scene & model management

Computer Vision

MediaPipe (v0.10.14) Hand Tracking

Gesture Recognition

Media Pipe Tasks Vision

Web Graphics

WebGL, Canvas, JS framework

Hardware-accelerated rendering

UI / Styling

CSS3

Responsive design, animations

Model Format

GLTF / GLB Loaders

Lumo Playground

Thank You!

Good Bye