



Beta Presentation

VR Human-AI Multimodal Interaction

The Capstone Experience

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*From Students...
...to Professionals*

Fall 2025

Project Overview

- CAD design is lengthy and gets held up in the corporate workflow
- Enable advanced CAD operations w/ human-AI interaction
- Expand CAD accessibility beyond experienced designers
- Simplifies the design process and reduces production time



Team Member's Technical Tasks

Technical Tasks Assigned

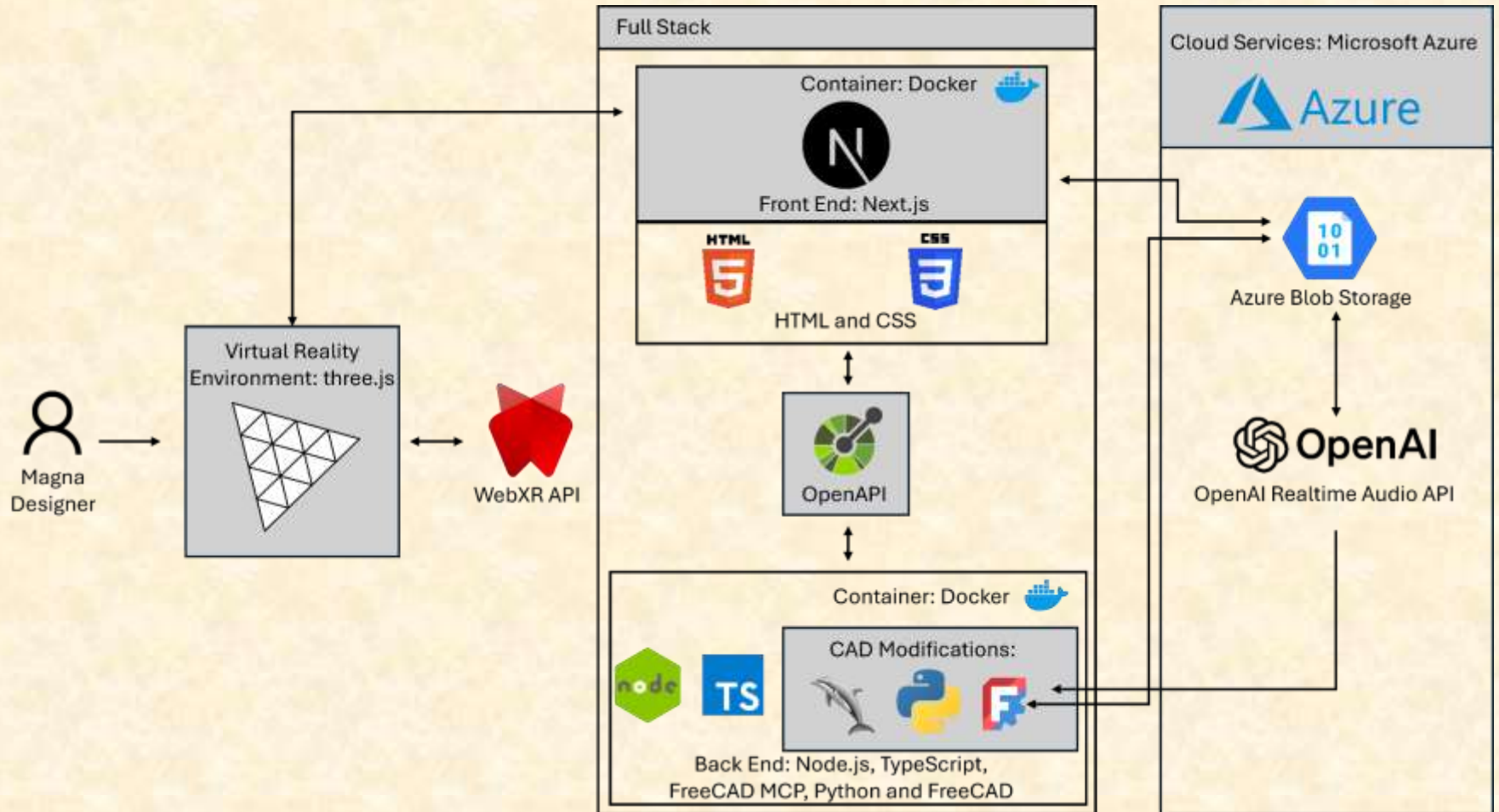
- Ryan Bolin
 - FEA simulation estimator
 - Recent file page
 - Model parsing
 - Model shadows and viewcube
- Aditya Menon
 - Containerize rpc_server and mcp
 - Created and maintained prompt engineering schema
 - Set up Postgres DB and improved Docker performance
 - Implemented authentication and user sessioning
- Preston Korytkowski
 - MCP and AI Agent connection and containerization in Docker
 - Azure Blob file system connection and synchronization with agent and UI
 - Model refresh upon user manipulation
 - MCP tool enhancement
- Ashish Pasula
 - 3D file upload and display
 - 3D file modifications and manipulations
 - Explosion effect for uploaded model
- Mohammed Alanizy
 - Setup the AR/VR environment
 - Hand tracking/gesture recognition for object interaction
- John Hidalgo
 - Created UI layouts for file overview and exploded model
 - Implemented web chatbot and connected it to FreeCAD MCP
 - Integrated Realtime voice recognition/transcription

Technical Tasks Completed

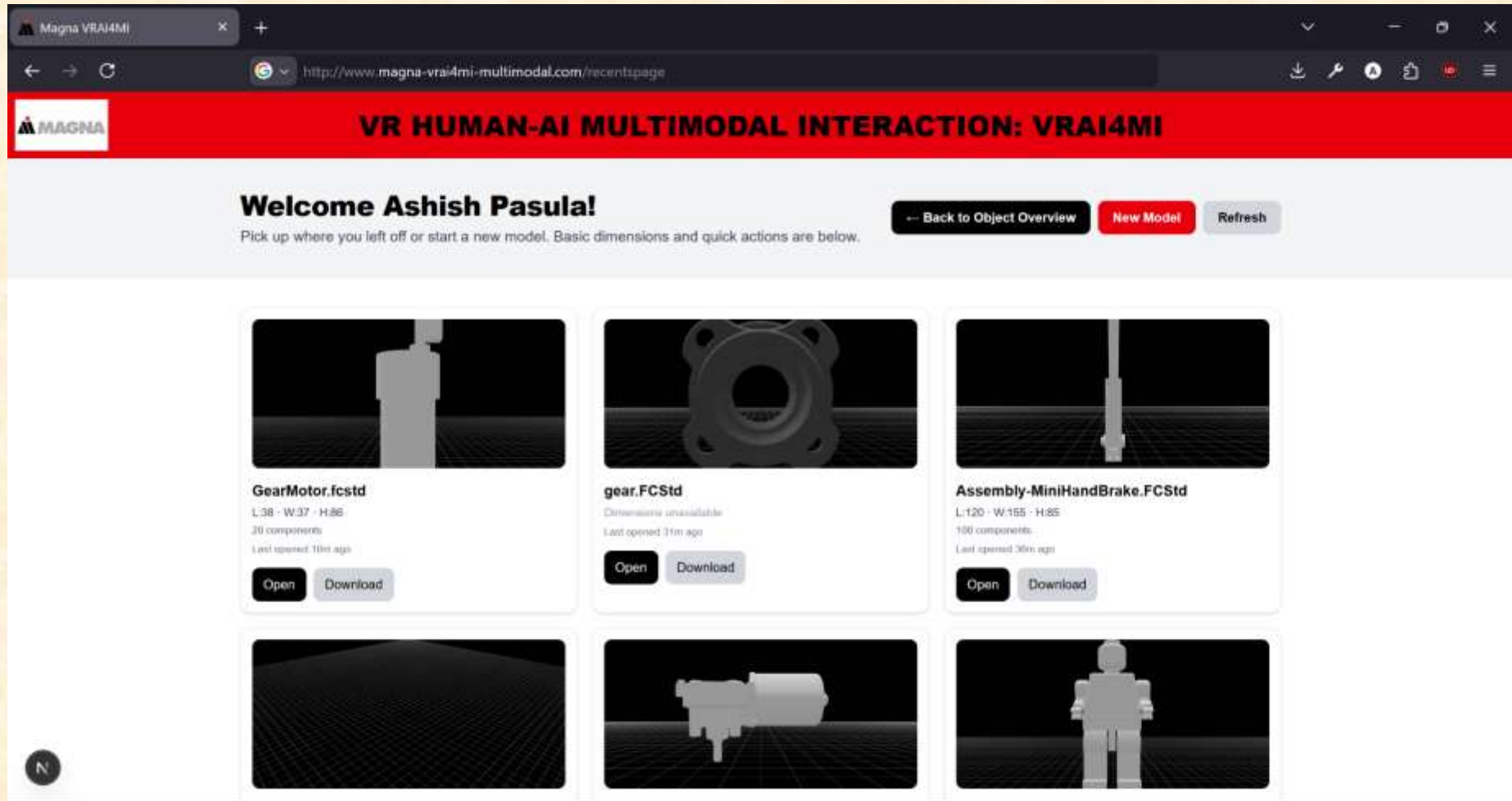
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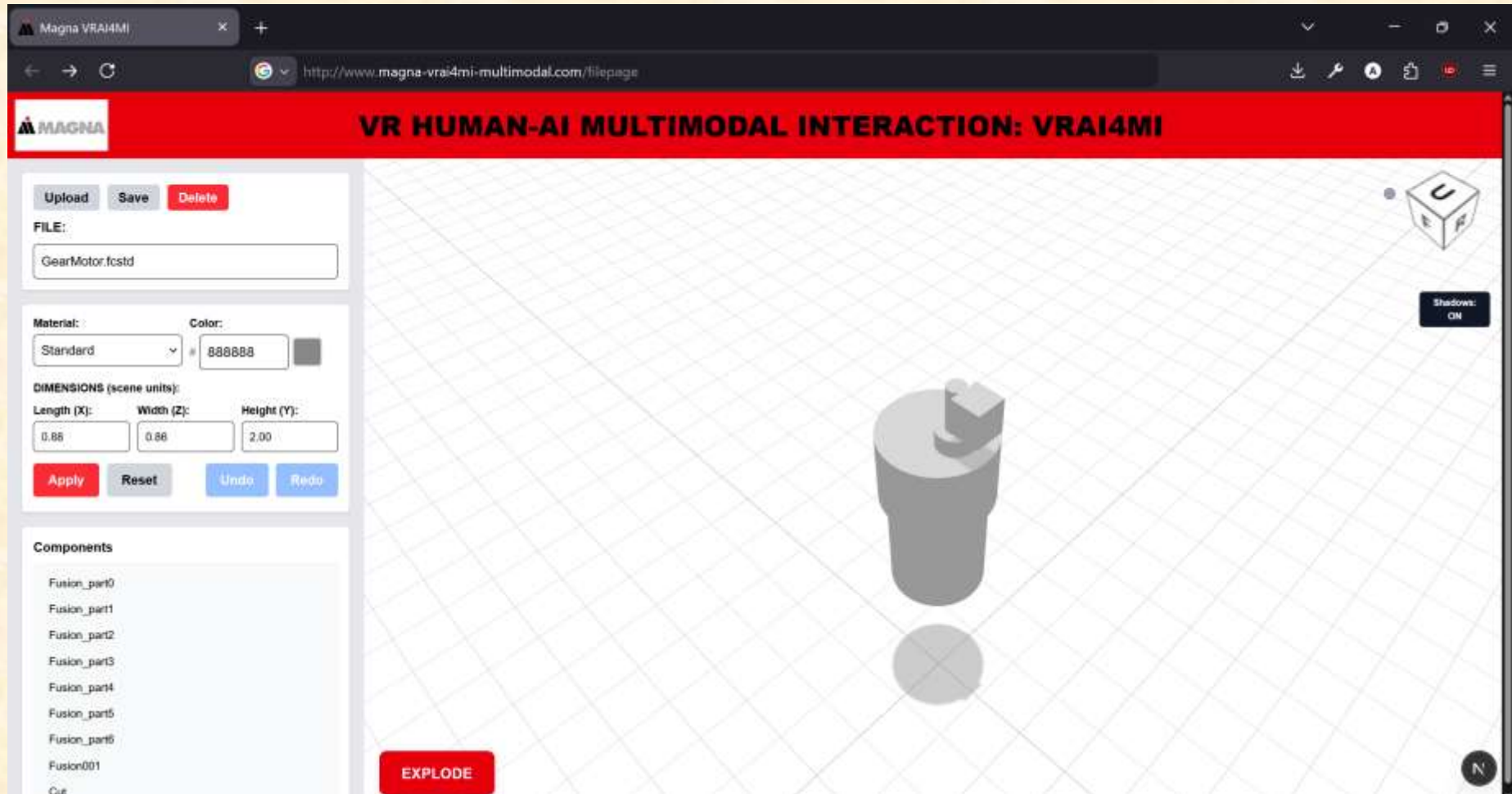
System Architecture



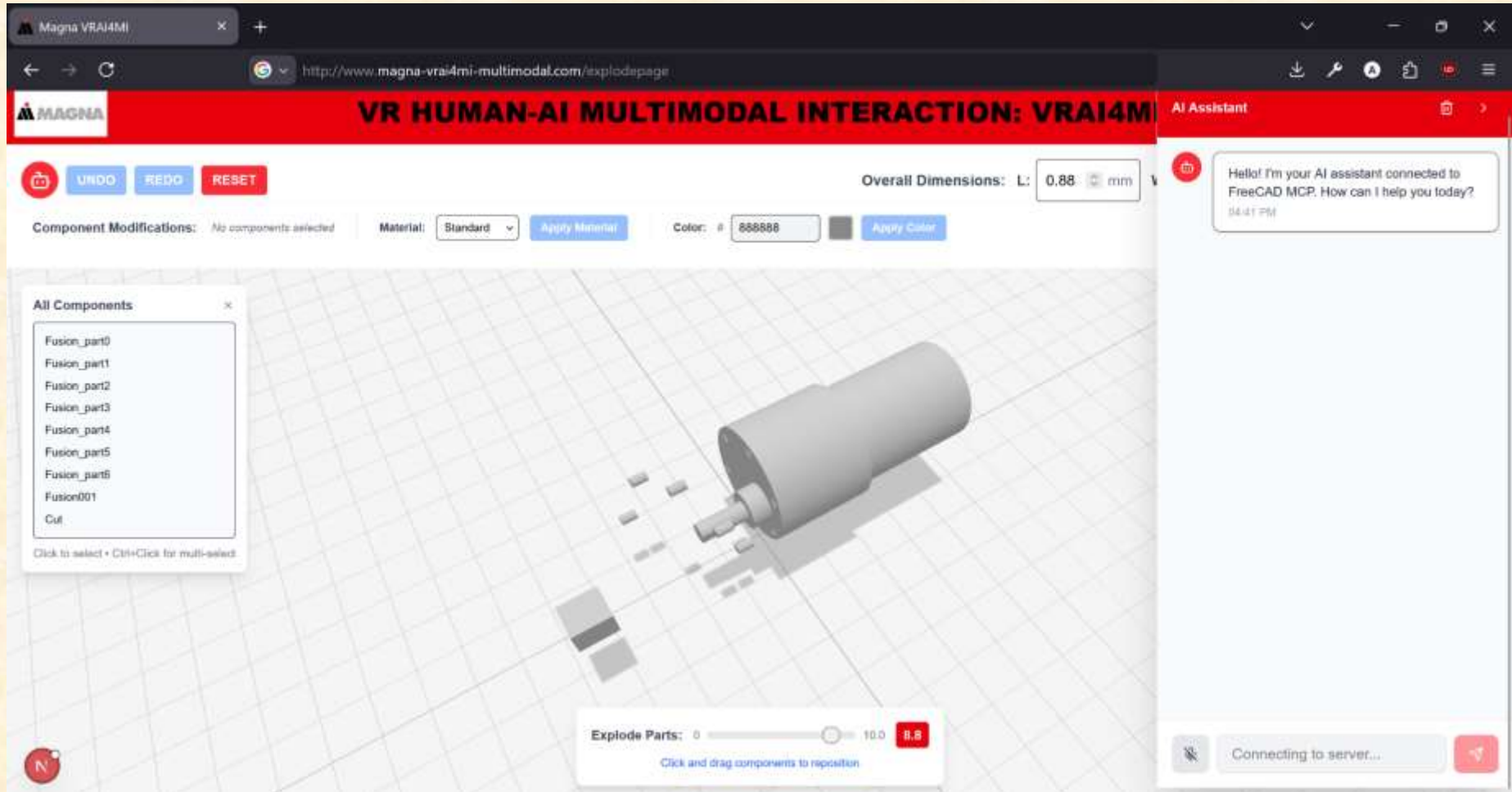
Recents Page



Object Overview Page



Exploded/AI Assistant Page



VR Environment



What's left to do?

- Features
- Stretch Goals
 - User isolation to RPC server
 - Multi-user collaboration
 - Cost analysis
- Other Tasks
 - Larger file uploads
 - Recent page file deletion
 - Dynamic exploded scaling



Questions?

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