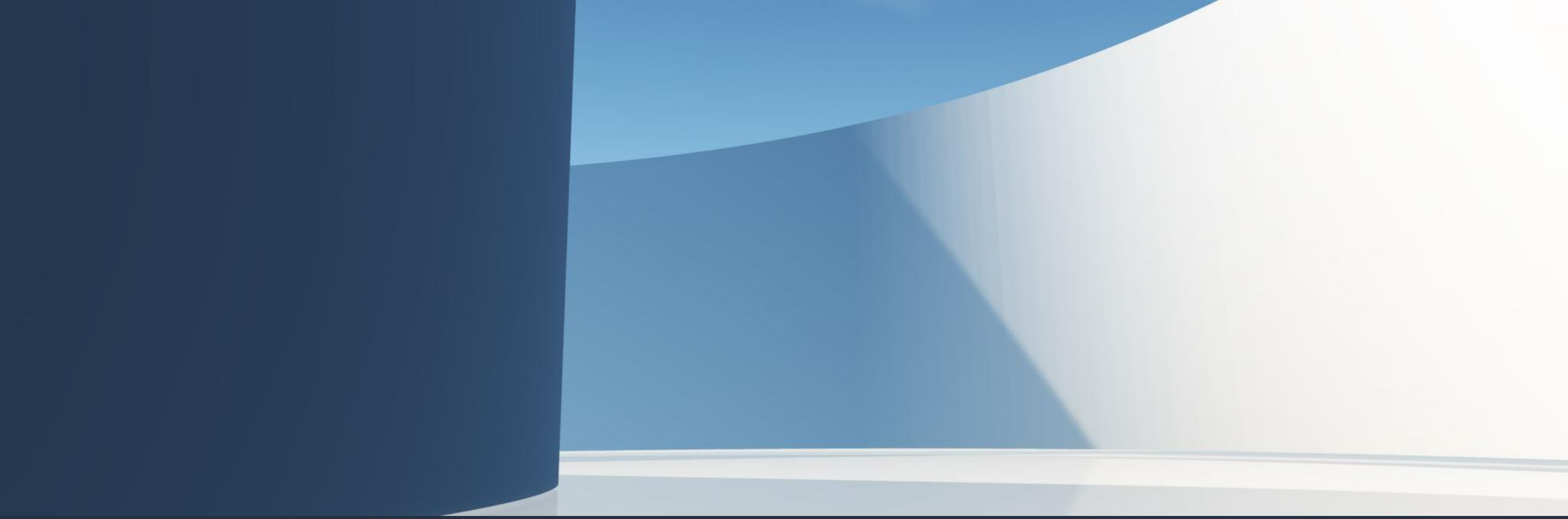

ASSIGNMENT 3
VR/AR ENHANCEMENT

YouTube Link:

https://youtu.be/x3tQLLYpTZA

GROUP 5: GONEFISHING

- Derek Ma (Team Leader)
- Arshan Abdi
- Kenneth Laird (Presenter)
- Anson Liu
- Curtis Pike (Presenter)

OVERVIEW

1. Proposed Enhancement
2. Approach to Implementation
3. SAAM Analysis
4. Current State
5. Effects of Enhancement
6. Use Case and Sequence Diagram
7. Potential Risks & Limitations
8. Testing Plans
9. Conclusion

PROPOSED ENHANCEMENT

- Enhancement to increase user immersion
- Virtual Reality/Augmented Reality Compatibility
- Would greatly increase immersion resulting in better training environment
- VR and AR split into separate approaches
- VR more immersive, more demanding
- AR less demanding, less stable

APPROACH TO IMPLEMENTATION

- Hardware-Software Interface Framework
- Integrate 3D rendering techniques
- Controllers & Gestures
- Testing & Integration
- Deployment & Feedback

SAAM ANALYSIS

- Major Stakeholders:
- End Users
- Project Team
- Project Managers
- Funders/Investors
- Regulatory Bodies
- Suppliers/Partners
- Training Institutions
- Aviation Industry
- Software Users Community
- Accessibility Advocates

CURRENT STATE OF VR/AR SUPPORT

Figure 1: FlightGear Virtual Reality screen-capture

- Highly experimental
- AR absent entirely
- VR implemented with “OpenXR” API
- Main Build, I/O Interface Subsystem Interactions
- Framework exists, needs proper implementation

EFFECTS OF ENHANCEMENT

- Conceptual Architecture
- Evolvability
- Performance
- Testability & Maintenance
- File & Overall Structure Modifications

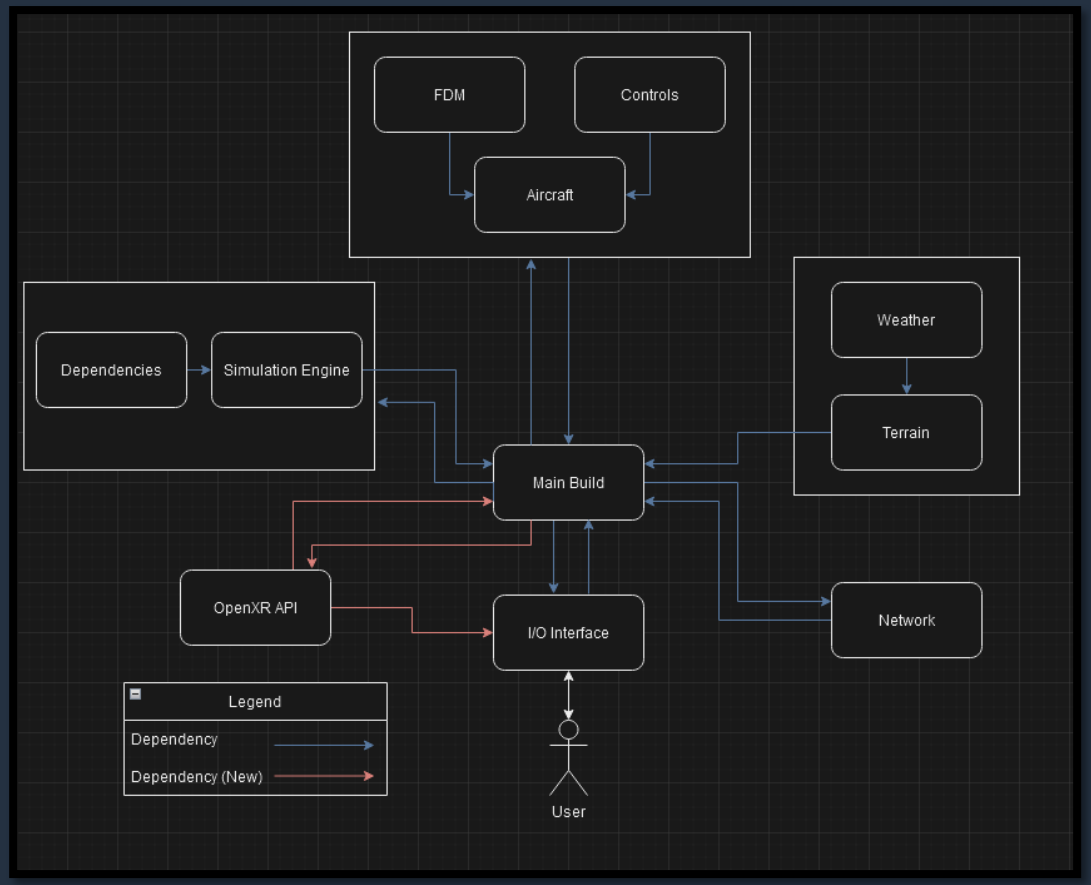

Figure 2: Revised Conceptual Architecture with VR enhancement.

USE CASE & SEQUENCE DIAGRAM

- Use case for Singleplayer Flight

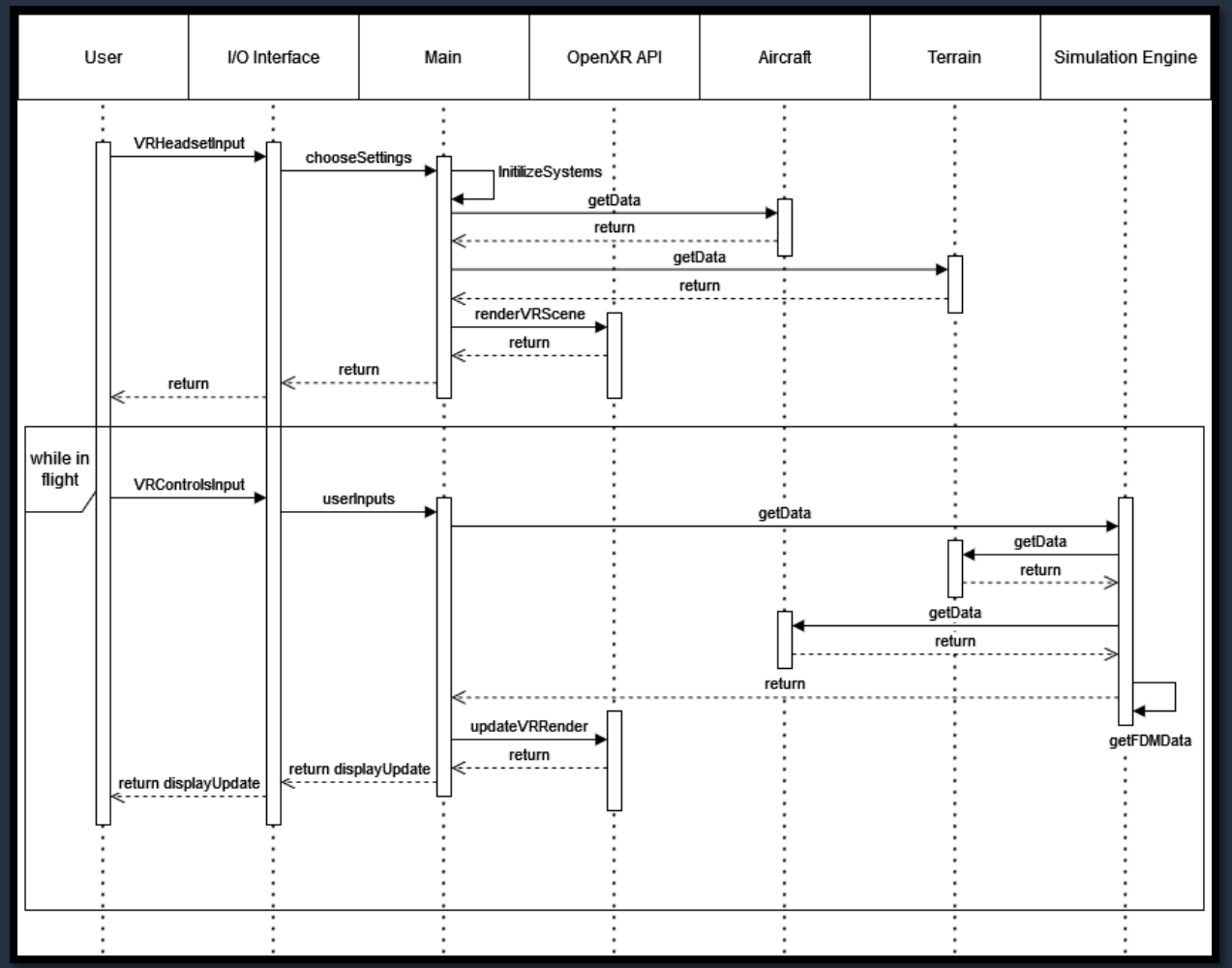

Figure 3: FlightGear Virtual Reality screen-capture

POTENTIAL RISKS & LIMITATIONS

- Physical Risks
- Maintainability
- Scalability
- Performance

TESTING PLANS

- Software and Hardware considerations
- Focus of testing on ensuring subsystem stability
- Testing interactions with new OpenXR API subsystem
- Unrealistic to assume smooth integration
- Focus on testing coverage for basic module functionality
- Problems more easily isolated

CONCLUSION

- Goal of enhancement: Immersion & Training Effectiveness
- Considered Methods: Virtual Reality, Augmented Reality
- System-wide Enhancement Effects
- Dependencies, Evolvability, Performance, Testability
- Ensure subsystem integration and interactions

LESSONS LEARNED

- Insight into VR/AR development
- Increased understanding of Flight Simulation software
- Insight into business and stakeholders through SAAM analysis
- Working as a team on tight schedule

END - THANK YOU