MIXING REALITIES

A McCarthy, Autodesk and DAQRI Partnership

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INDUSTRY TALK

AUTODESK. UNIVERSITY

Agenda



Mixing Realities - Agenda

AUGMENTED REALITY (AR): DEFINED

Context for our discussion

THE VALUE OF AR

Building Massing, X-ray vision, QC, As-Built Validation

CASE STUDIES

Providence Tarzana Medical Center

CURRENT REALITY

Hardware, Software, Jobsite

FUTURE POTENTIAL

Vision and commitments

CALL TO ACTION

Don’t wait!



Augmented Reality: Defined



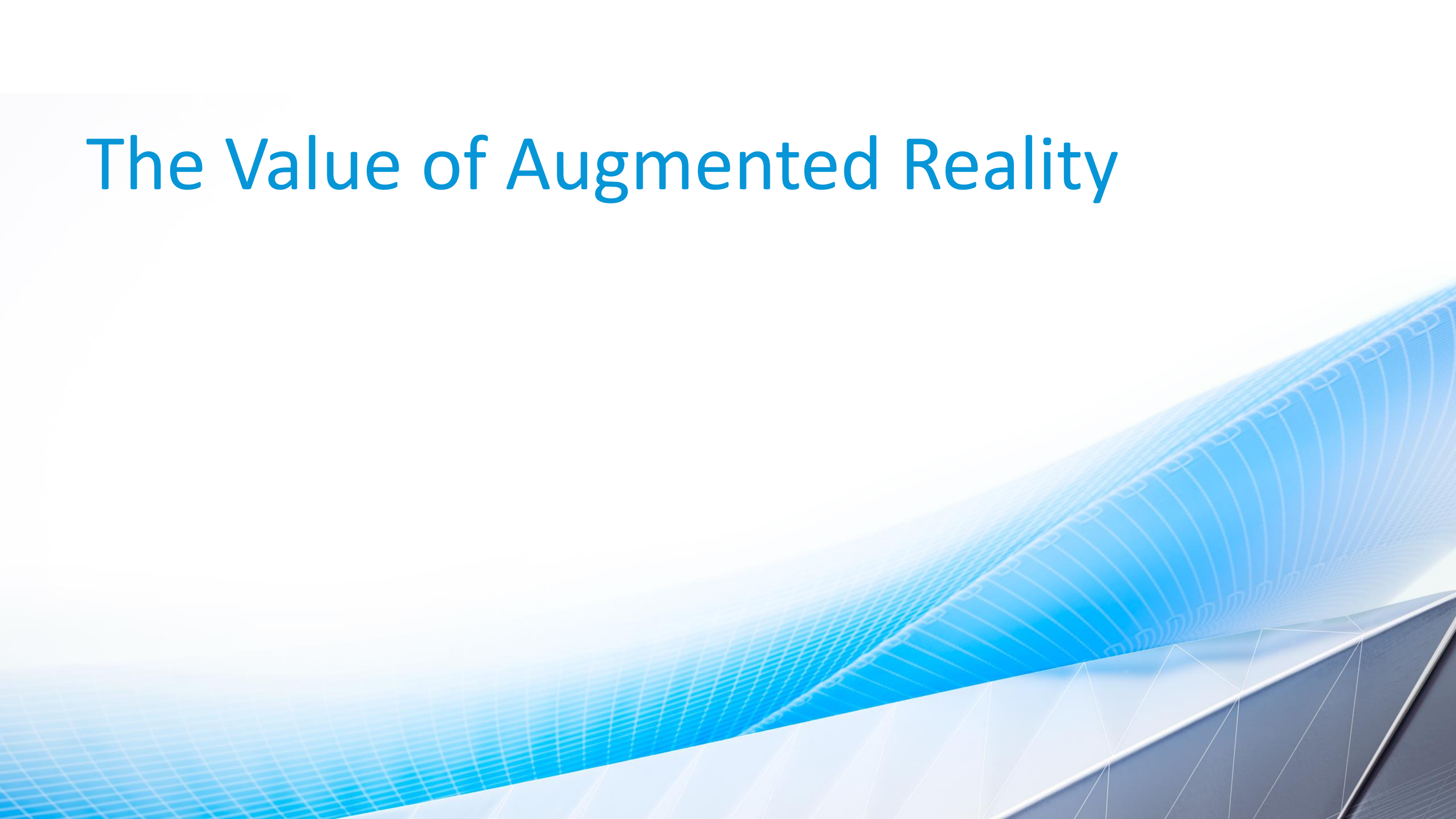


Augmented Reality: Defined

Cambridge Dictionary

“Images produced by a computer and used together with a view of the real world”

The Value of Augmented Reality



Mixing Realities – The Value of Augmented Reality

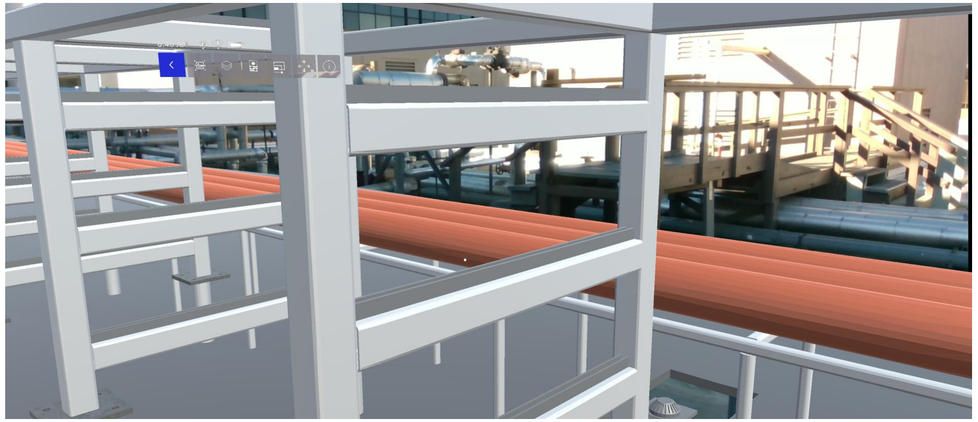
BUILDING MASSING



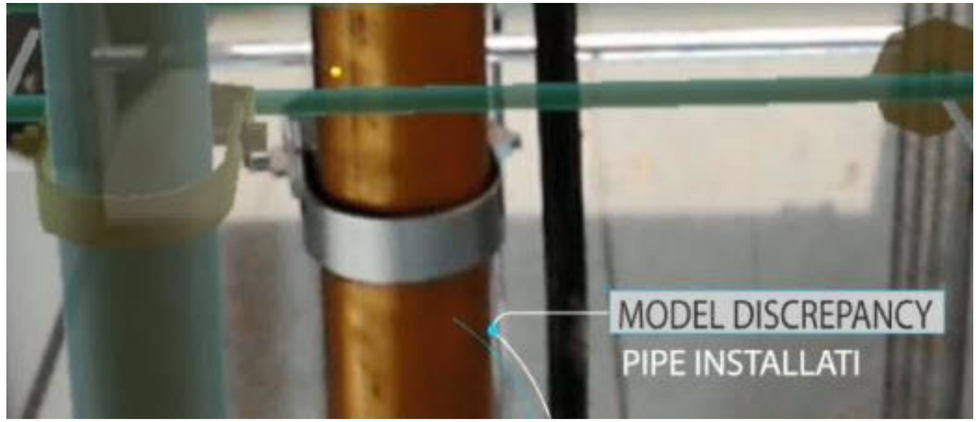
X-RAY VISION



QUALITY CONTROL



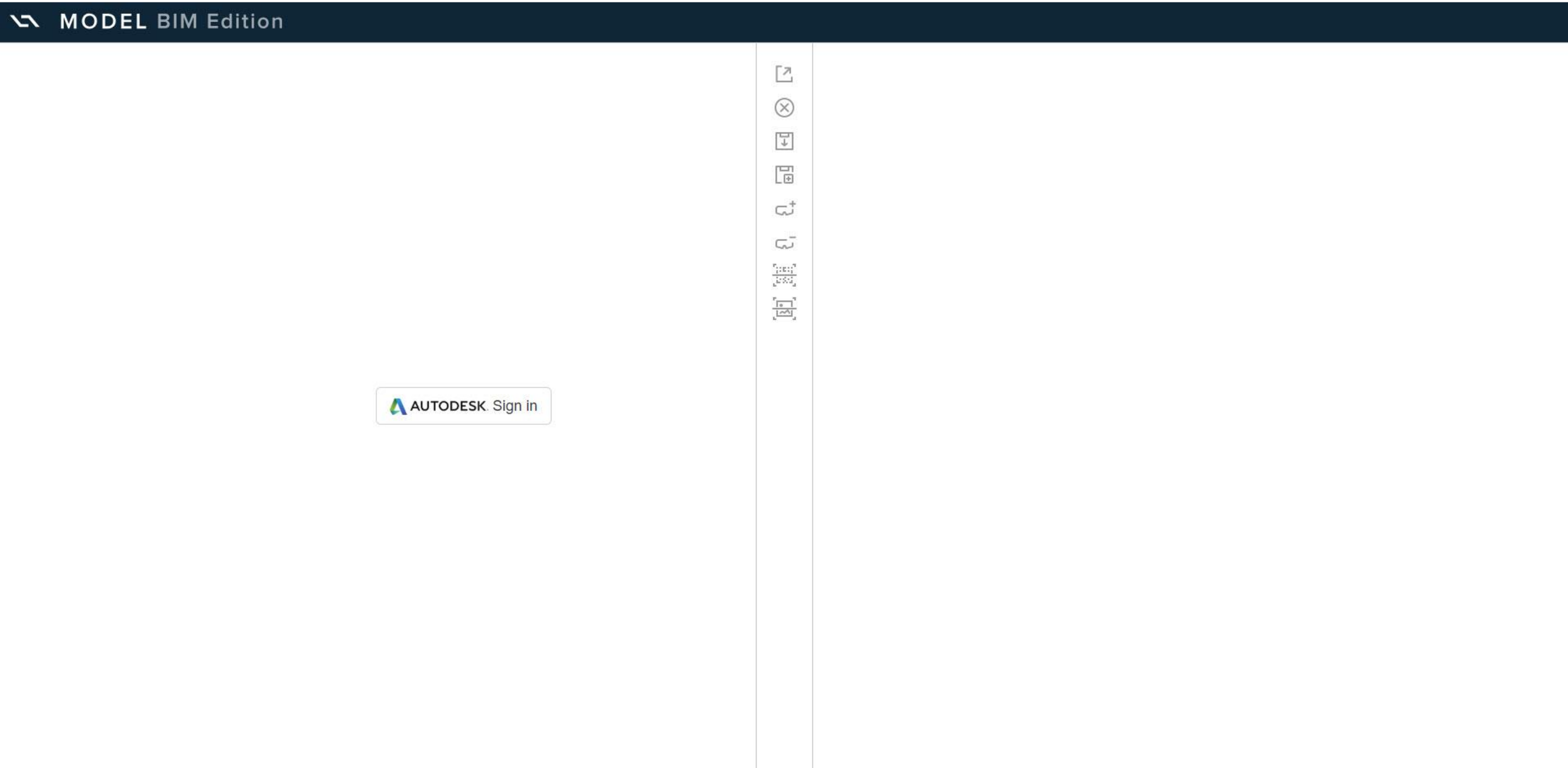
AS-BUILT VALIDATION



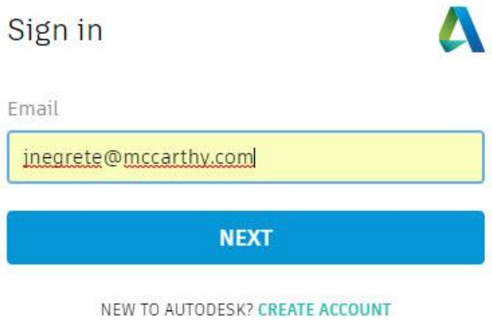
Case Studies



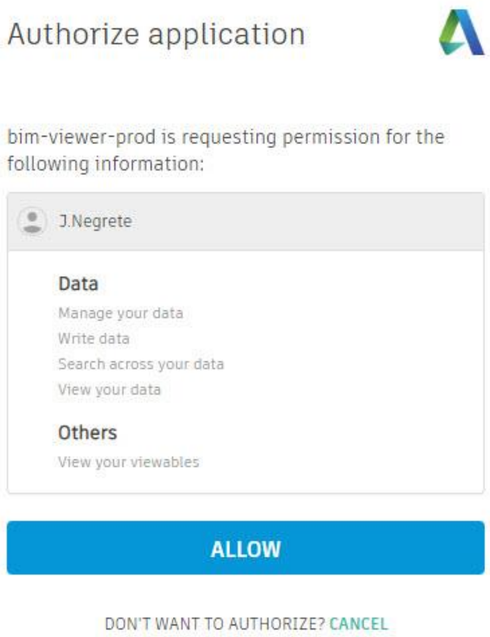
Computer Interface



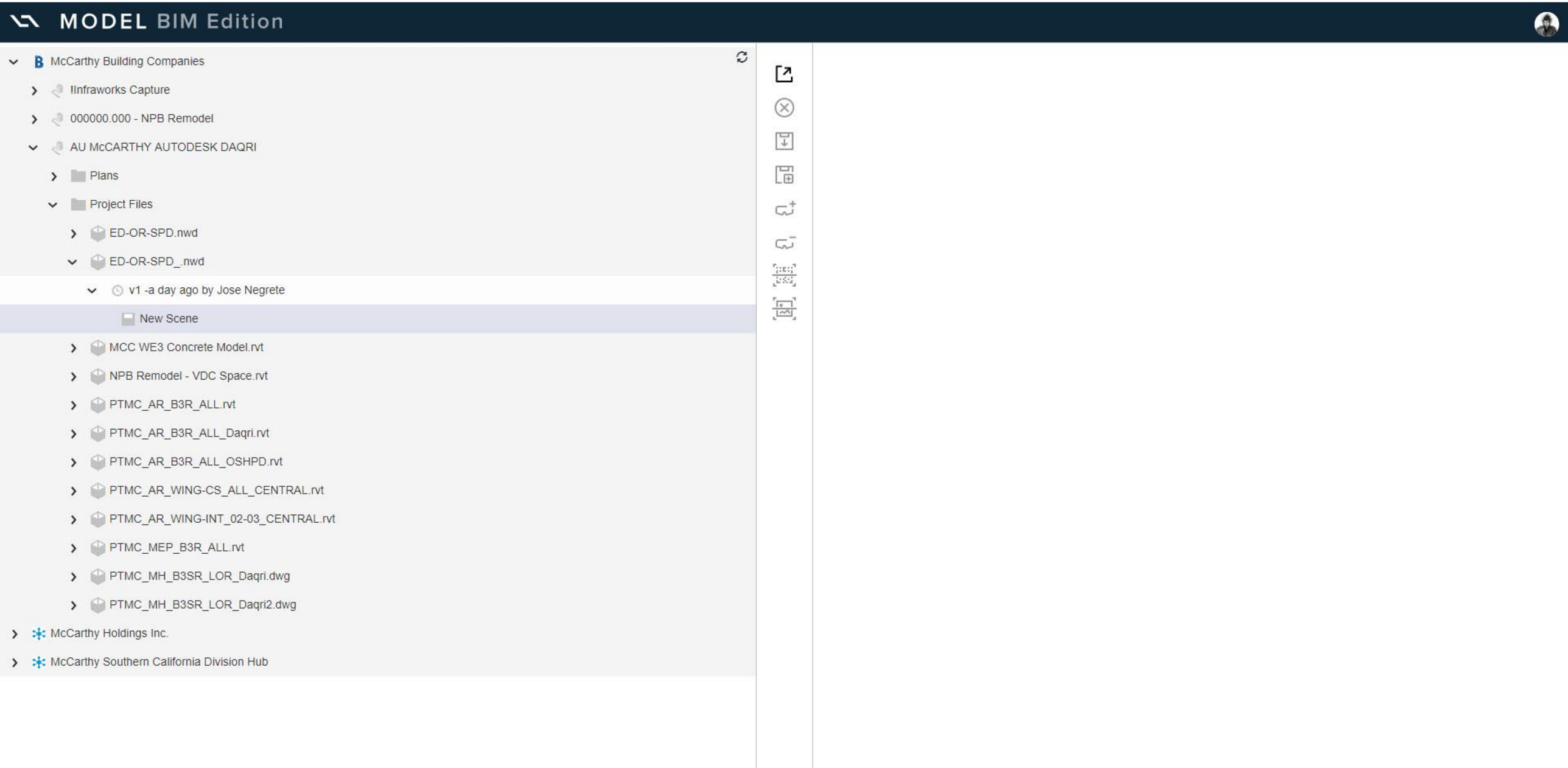
Computer Interface



Computer Interface



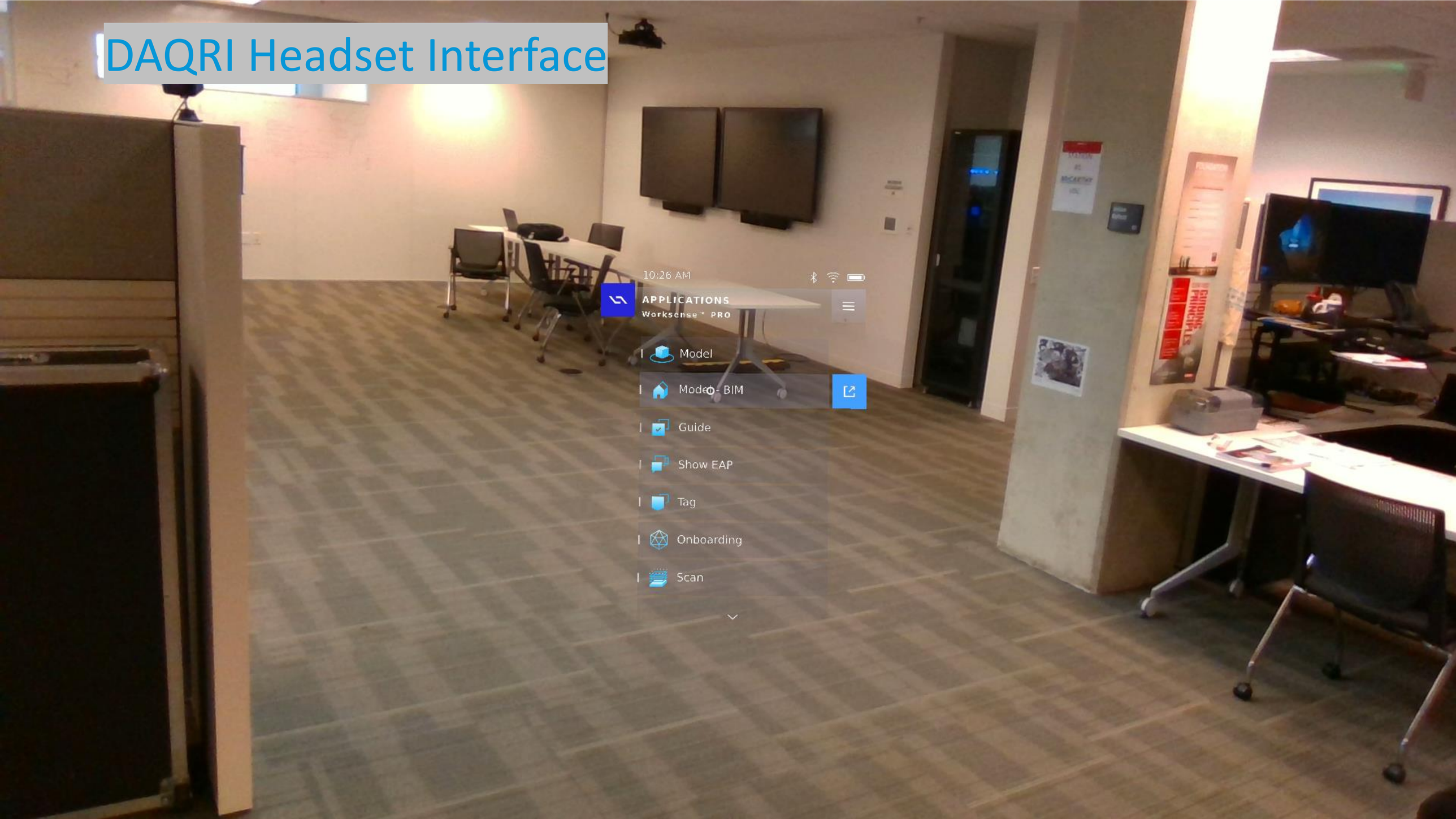
Computer Interface



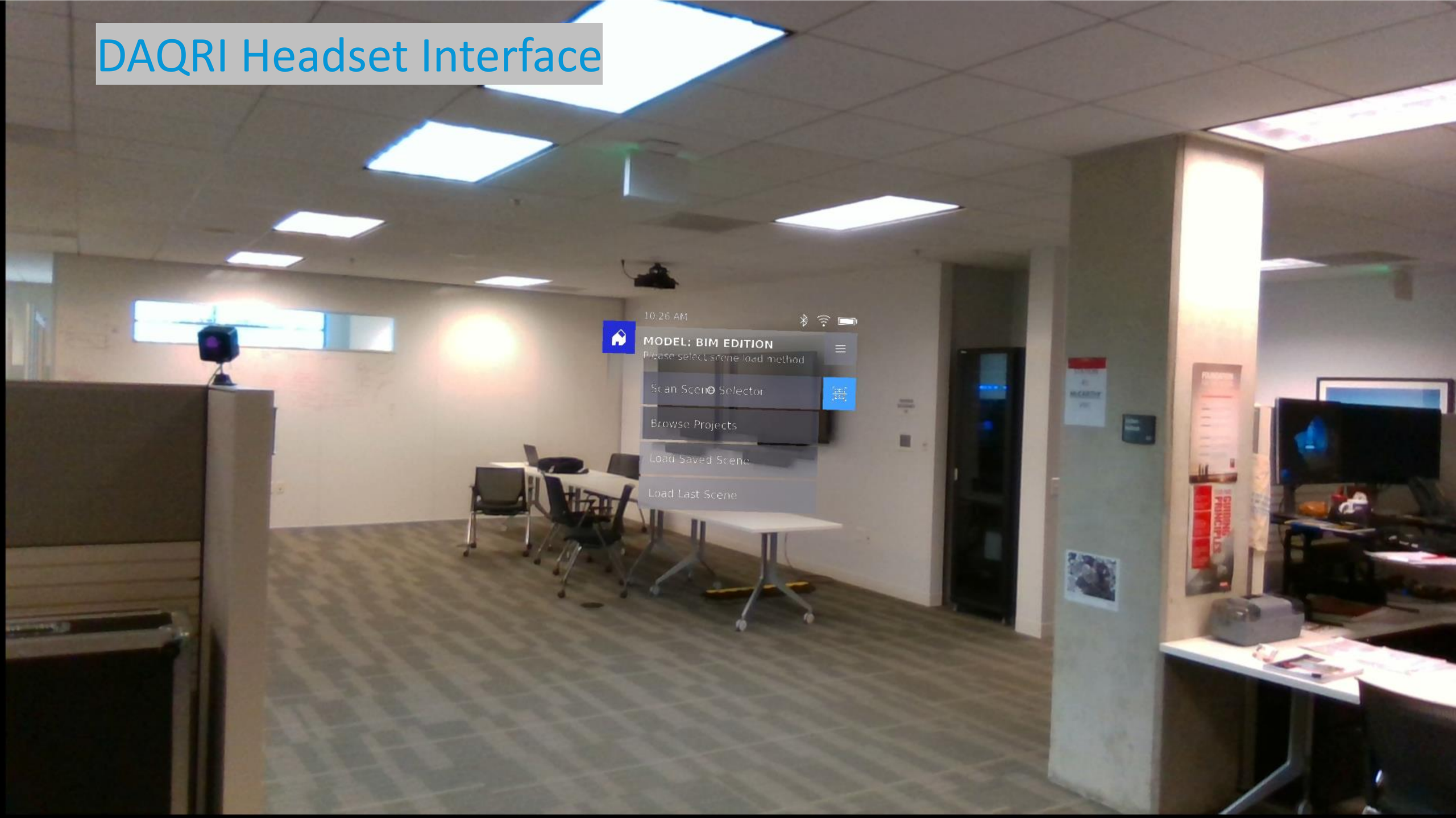
Computer Interface



DAQRI Headset Interface



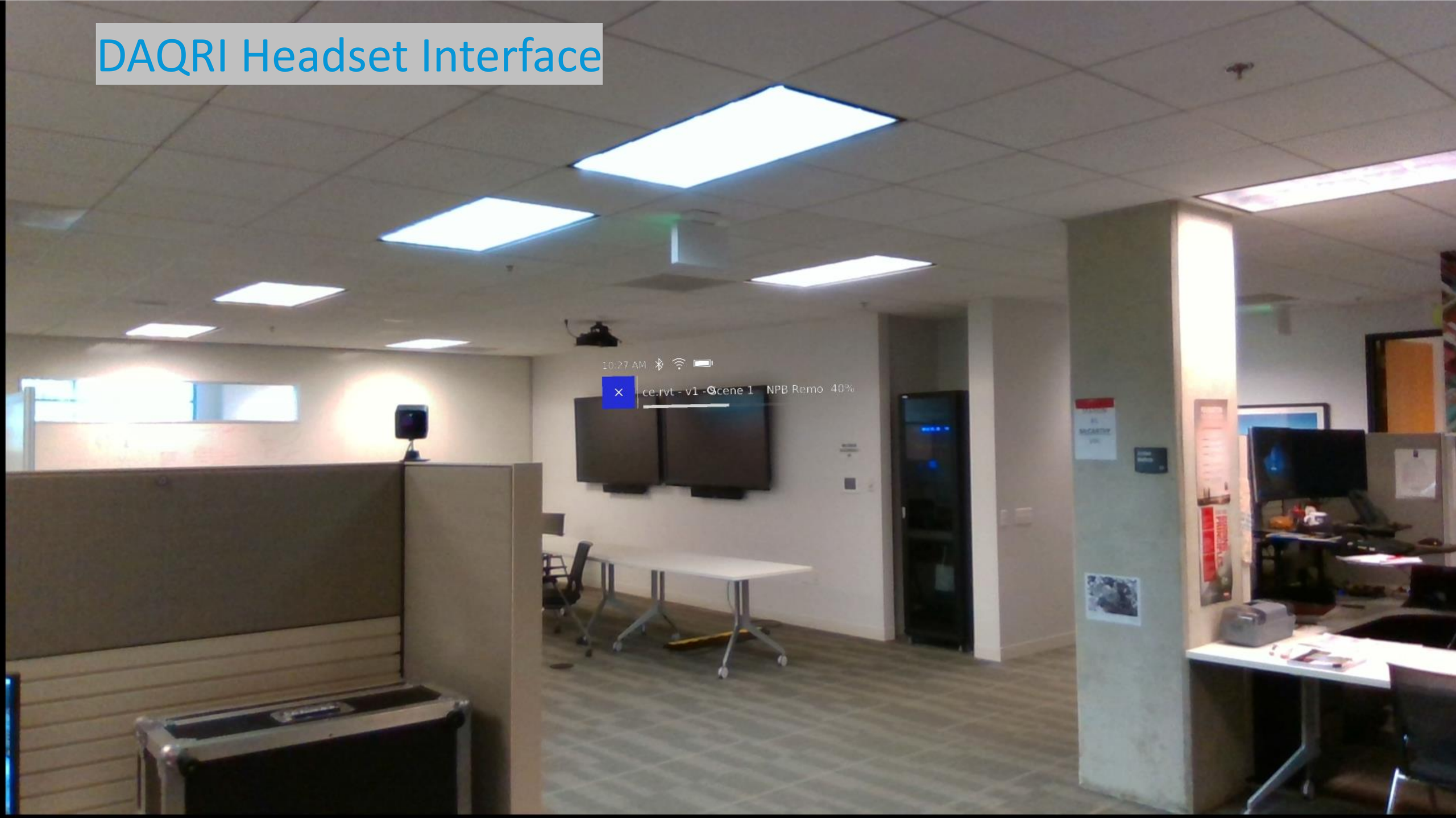
DAQRI Headset Interface



DAQRI Headset Interface



DAQRI Headset Interface



DAQRI Headset Interface



Providence Tarzana Medical Center

Building Massing in Context with Existing Site



Providence Tarzana Medical Center

Building Massing in Context with Existing Site



Providence Tarzana Medical Center

Quality Control New Work in Existing Facility



Providence Tarzana Medical Center

Quality Control New Work in Existing Facility



Current Reality





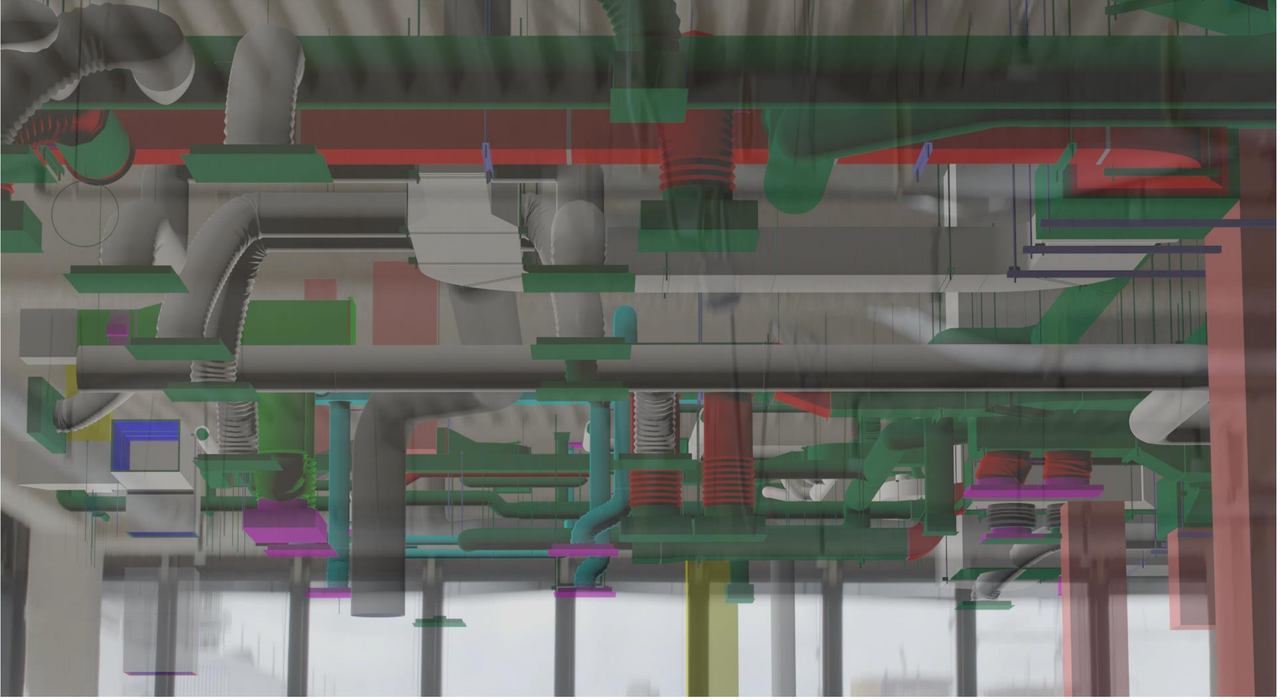


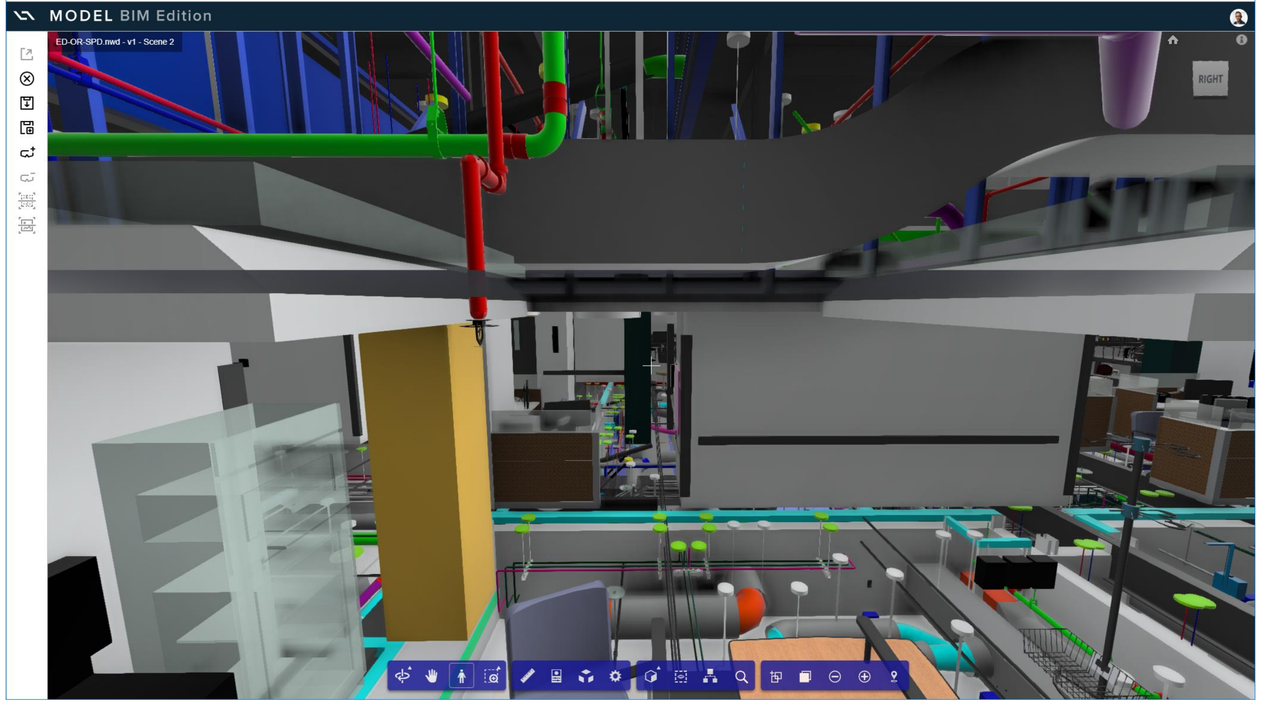
Eye-Gaze Technology

DAQRI Smart Glasses use a visual reticle (mouse cursor) controlled by the user's gaze. The user's hands are free for tools, materials, paperwork, climbing, or anything else required to perform the task.

Models without WiFi

3D model scenes can be downloaded and saved locally to the Smart Glasses, then loaded from memory wherever they are needed, even in areas without WiFi connectivity.





Anchoring

Accurate and stable alignment of 3D and BIM models with the physical environment requires sophisticated computer vision technology.

Mitigations: improved localization (positioning) using dynamic maps; improved inside-out user position tracking

Model complexity

Visualizing complex BIM and 3D models requires significant computational processing. Wearable technologies have limited processing power due to competing requirements for light weight, low heat output, and long battery life.

Mitigations: advanced portable processors; improved model rendering; model decimation to reduce model complexity





Sensor Limitations

Improved tracking, positioning, anchoring, and field of view all depend on high performance sensors: RGB and depth cameras, inertial measurement unit, see-through displays, projectors.

Mitigations: Smaller yet higher performance sensors; improved displays and projectors; lighter, longer-life batteries

Comfort and Compatibility

Most current AR wearables are not sufficiently comfortable for long usage. They also need to fit with other wearables such as hard hats.

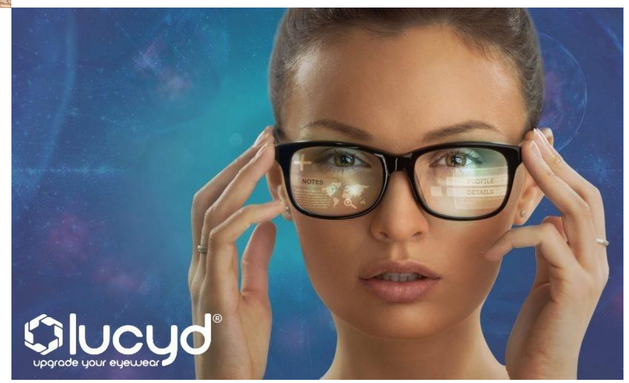
Mitigations: Better hardware miniaturization enabling smaller, lighter, more comfortable glasses.

Future Potential









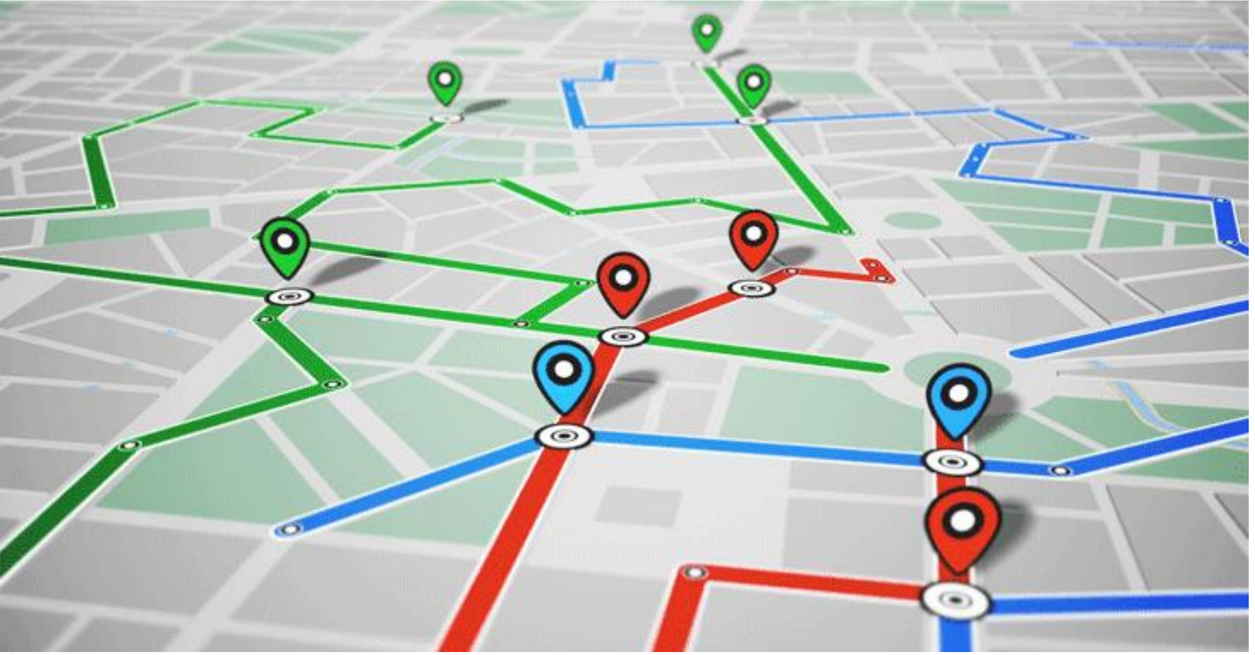


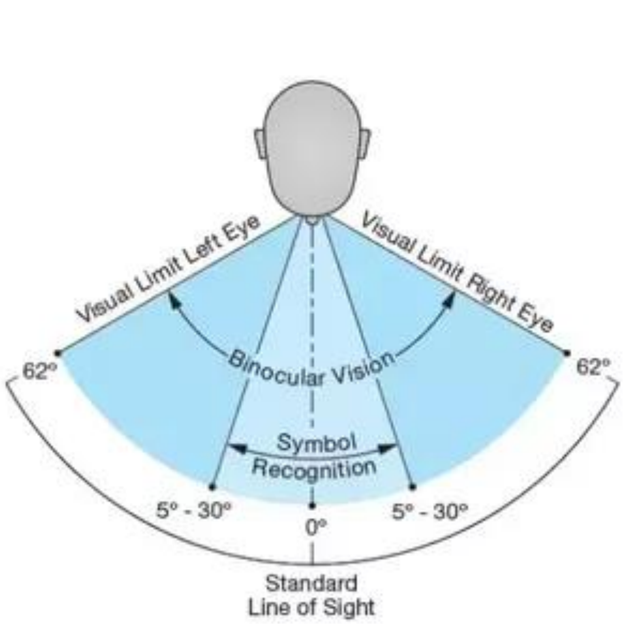
Ergonomic and Stylish Designs

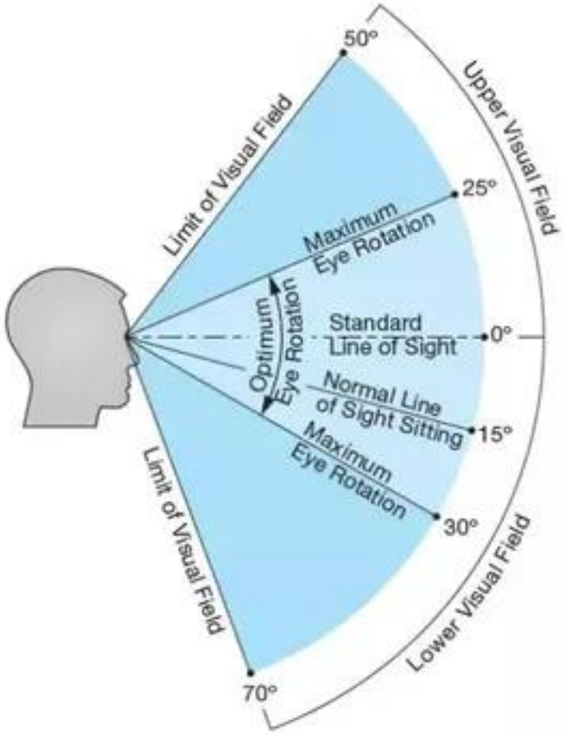
Improved miniaturization of cameras, sensors, processors, and batteries will enable lighter, cheaper, more comfortable, and more stylish AR smart glasses.

More Immersive Experiences

Improvements in both AR hardware and software will enable more immersive AR experiences, with better positioning and tracking, higher performance graphics, and all-day battery life.







Enhanced Location Tracking

Ability to constantly adjust the model location to world coordinates based on GPS, or enhance AI/forward facing camera with geometry recognition

Improved Field of View

To accomplish mixed reality that will overtake our industry, the field of view in available devices needs to match that of normal human vision, both in width and height.

Call to Action





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