

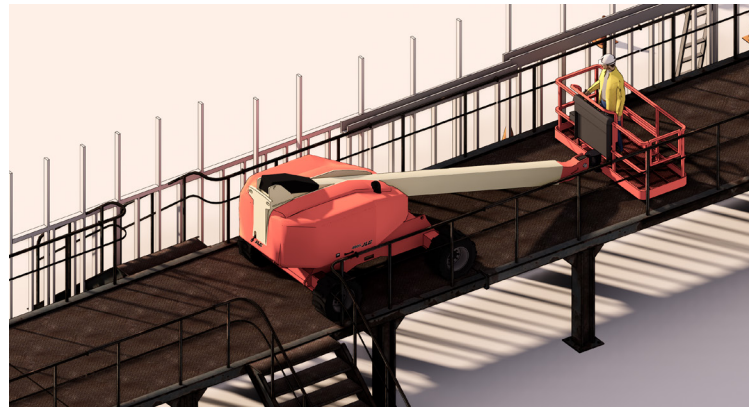
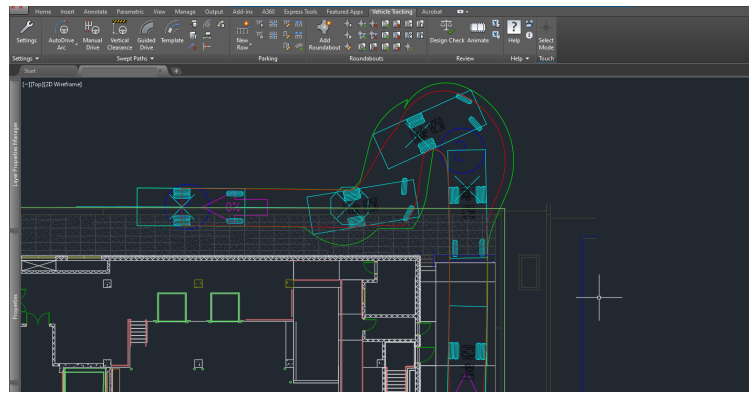
DIGITAL TWIN FOR BUILDING OPERATION SIMULATION

CONCEPT

A DIGITAL TWIN IS BECOMING A POPULAR IDEA IN THE INDUSTRY THAT ALLOWS DESIGNERS AND CLIENTS TO TEST OCCUPANCY, BUDGETS AND VISUALIZATIONS. AS WE INTEGRATE MORE COMPLEX GAME AND PHYSICS ENGINES INTO THE SE VIRTUAL DUPLICATES OF OUR PHYSICAL BUILDINGS, WE WILL HAVE THE TOOLS TO RUN REAL TIME SIMULATIONS THAT CAN BACK OUR IDEAS WITH CONFIDENCE. I AM SPECIFICALLY INTERESTED IN USING REALISTIC GAME ENGINES TO SIMULATE COMPLICATED CONSTRUCTION TECHNIQUES AND BUILDING MAINTENANCE OPERATIONS. I IMAGINE SIMULATIONS IN THE DIGITAL TWIN IN THESE AREAS OF INTEREST WILL HELP CONSTANTLY INFORM THE PROJECT THROUGHOUT THE BUILDING'S LIFE.

WHY?

WE HAVE USED MANY TWO DIMENSIONAL TOOLS (SUCH AS VEHICLE TRACKER FOR AUTOCAD CIVIL) AND GONE THROUGH HOURS WORTH OF COORDINATION MEETINGS TO DISCUSS BUILDING OPERATIONS AND INSTALLATION TECHNIQUES. I HAVE FOUND THE PLAN AND SECTIONAL DIAGRAMS WE CREATE FOR THINGS LIKE FAÇADE MAINTENANCE ARE NOT CONVINCING ENOUGH AND LEAVES THE CLIENT WITH SOME CONCERNS AFTER THE MEETING.



HOW?

I'M INTERESTED IN HOW A GAME ENGINE MIGHT EXPEDITE THIS PROCESS BY SIMULATING OPERATIONAL EQUIPMENT'S SUCH AS AERIAL LIFTS WITH REAL LIFE CONDITIONS. FOR EXAMPLE, THIS COULD INCLUDE THE GLAZING PANELS STRENGTH PARAMETERS AND THE AERIAL LIFTS TURNING RADIUS AND WEIGHT. THESE PARAMETERS ACCOMPANIED BY 3D VISUALIZATION WOULD GIVE CLIENTS MORE CONFIDENCE IN OUR ANALYSIS AND SERVICE.

NEXT STEP?

FIRST STEPS COULD BE TO TAKE INFORMATION FROM TWO-DIMENSIONAL SOFTWARE SUCH AS VEHICLE TRACKER AND TRANSLATE THE PARAMETERS TO A GAME ENGINE. THIS WOULD BE TESTED IN AN ENVIRONMENT WHERE SURFACES HAVE A CERTAIN BREAK POINT TO TEST IF THE EQUIPMENT CAUSES ANY DAMAGES.

TWO DIMENSIONAL SOFTWARE FOR BUILDING OPERATION COORDINATION (VEHICLE TRACKER FOR AUTOCAD SHOWN HERE)

THREE DIMENSIONAL VISUALIZATION

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INPUT PHYSICAL PARAMETERS:
-STRUCTURAL LOADS & CAPACITY
-MATERIAL PROPERTIES
-VEHICLE SPEED
-TURNING RADIUS

+

GAME ENGINE

GAMIFICATION OF BUILDING OPERATIONS WITH REALISTIC PARAMETERS AND VISUALIZATIONS FOR TESTING