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THE FUTURE OF STRUCTURAL ENGINEERING

How Advanced Model-Based Deliverables and AI can help Structural Engineering in the future

It is now 2022. Many engineering firms have thoroughly planned out the year accordingly based on projects on the books and more to come based on RFQs, RFP, and SOQs. So the question at hand is, did they think technologically, and did they think far enough into the future?

Currently, we are standing on the precipice of a new leap in technology that will significantly advance how engineers approach engineering designs.

Advanced Model-Based Deliverables, Building Information Modeling (BIM) being one of them, provides the ability to create 3D content and has become the industry standard for the built environment. However, the metaverse, labeled as Web 3.0, is about to take 3D modeling to a new level.

How? First, it will change how you and your team collaborate and share ideas. Design teams will meet as avatars in virtual reality (VR) meeting rooms in the metaverse to collaborate and exchange ideas in real-time. Documents will be discussed and edited, and objects modified. It is being of the moment when it is happening.

Second, with artificial intelligence (AI) advancement, traditional engineering tasks will become more automated and turned over to advanced solutions software, supplemented by cloud-enabled access to mighty calculating power. As a result, AI will reduce engineering time on more mundane tasks, shaving hours off such tasks, increasing efficiency.

Communication between design team members has become an increasingly complex problem. The advent of Visual Programming and Parametric Modeling solves this problem. Parametric modeling refers to the process of establishing parameters of a design that are allowed to be variable, setting criteria for how those parameters can vary, and then running multiple analyses to obtain the final design of the system over the entire range of parameter steps. Visual programming provides an interface that allows the programming logic to be readily seen, understood, and implemented by the whole design team.

As with all advances, it may seem as if the current methods of structural engineers might be going away, but nothing could be further from the truth. Of course, it's true that automation saves time and makes some of the engineer's traditional tasks redundant, but that makes structural engineers more relevant. Since they will have

tools to alleviate them from the smaller tasks, they will have more time to focus on what has always been a core value — creativity.

Traditionally, architects would conceive a building form and then talk to engineers to discuss building it. But that has changed, and structural engineers are now part of design teams much sooner and are contributing to early form-finding.

How can you embrace the Metaverse and VR in your designs, builds, and planning?

1. Clients and the AEC teams can collaborate remotely, staying on the same page using VR, reducing travel and frequency of meetings.

2. Immersive issue tracking to BIM inspecting and layer visibility settings.

3. VR allows you to test every option in a lifelike context, allowing for collaboration and reduction in design cycles.

4. VR conferencing allows for a full-sensory presentation that will speak to every learning style.

By harnessing the advancing computer tools and embracing new skills, structural engineers will become a vital part of the vision for the built world of tomorrow.

Innova has embraced AI for many years, especially in the design of monorail structures where the use of AI has extensively reduced the labor of grouping frames that hold geometric similarities.

By Craig Ruark for Innova Technologies, Inc.