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Daily Dynamo: Innovative Solutions to Everyday Structural Problems

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Learning Objectives

- Share practical applications of Dynamo
- Discuss ways to utilize Dynamo to solve everyday problems
- Learn how to incorporate Dynamo into daily workflows
Discuss how structural engineers are using Dynamo

Description

Dynamo is exciting, and the examples of its capabilities are awe inspiring, but are they practical in a real-world structural workflow? When an engineer creates a Dynamo script that resembles a bowl of spaghetti but will create some elaborate structure, is that practical and useful on a daily basis? While the farfetched and futuristic capabilities are exciting for probably 1% of projects, are they applicable to the other 99%? This session will focus on the other 99%. Due to the perception that it is only for the crazy stuff, many structural engineers have not explored Dynamo. Instead of ignoring a fantastic technology, engineers should learn ways to utilize Dynamo. This roundtable will offer an environment for structural engineers to share ideas for utilizing Dynamo to create innovative solutions to real-world, everyday problems.

Your AU Expert

Desirée Mackey has been in the architecture, engineering, and construction industry for more than 15 years. After obtaining her bachelor's and master's degrees from the University of California, Davis, and the Massachusetts Institute of Technology, she perpetuated her nerdy tendencies with Revit. She started her career in California with a construction company, she continued with a structural engineering firm, and now she is a structural engineer and Building Information Modeling (BIM) manager at Martin/Martin in Colorado. Dezi is a regular speaker at many conferences. She is a co-founder of the Rocky Mountain Building Information Society, the chair of the Structural Engineers Association of Colorado's BIM Committee, a member of the RTC North America Committee, and a member of the AU Advisory Council. Finally, as if that's not enough Revit in her life, she's married to "The Revit Geek" and acts as a partner in his BIM consulting firm, BD Mackey Consulting.

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Introduction

This roundtable is intended to be a collaborate place for everyone to share and discover ideas about the application of Dynamo in every day structural engineering. The class will present five questions to help prompt the identification of challenges that could be addressed using dynamo. Each attendee is encouraged to share what they have done with Dynamo, what they would like to do, or what they struggle with. This session will focus on identifying areas for potential use of Dynamo, not necessarily the detailed solutions.

Questions to Discuss

The following are the base five questions that will be discussed within the class, but the discussion may take us other places as well. Please feel free to use the space below to take notes or to write down ideas.

What kinds of tasks lend themselves well to the use of Dynamo?

- Sloped framing
- Creating sheets
- Scheduling
- Fixing Revit problems that Revit can't do itself
- Analytical output processing/importing
- Populating shared parameters
- Tedious and generic
- Splicing columns – not based on levels?
- Best if the script can be reused – one-time uses aren't as efficient
- Selection features that help avoiding rebuilding the script
- Spreadsheet linking

What should Dynamo not be used for?

- Write scripts to replace Revit things that Revit can already do efficiently
- Need to know Revit well enough – Use Revit features first
- Writing a script to something specific, time spent on something used only once
- Scripts can be too complicated to understand
- Families can be convoluted
- May not speed up workflow
- Must first know if the question could be answered within the software

What tasks in Revit are repetitive?

- Tagging info for hundreds of elements that would otherwise be manual
- Script for XYZ coordinates and schedules
- Propagating grid extents when the Revit tool won't work
- Update families
- View creation based on scope box(es)
- Check the "Revisions on Sheet" box(es)
- Calculating centers of gravity
- Beam tagging/elevations not adequately completed by the Beam Annotation tool
- Cleaning up annotations



- Disable analytical
- Communications between software platforms
- Reinforcing schedules
- General notes – copy and pasting
- Turning links off, shadows, changing views

What could Dynamo address that Revit can't on its own?

- Texted concatenation
- Optimizing solar arrangement then load to Revit
- Extract information from .txt files
- Verify connection design
- Script to get rid of views that are not needed
- Placing views on sheets
- Section cuts around sheet?

Could Dynamo help with any engineering tasks?

- Beam family with embedded plates – pull beams out and send to spreadsheet – then test the reactions with the allowable – if passes then leave – if doesn't pass then changes it to be special
- Minimum steel requirements
- Shearwall design
- Pull information from user-authored spreadsheets
- Beam calculations
- Create your own custom selection sets
- Analytical results into Revit

Marketing and other miscellaneous topics

- Highlight my model on what the architect changed
- What has changed and what is new?
- Column locations that are slightly off grid
- Tagging top of piers with cap
- Quantities for estimating and pricing?
- Load diagrams

Conclusion

The goal for this discussion is that each attendee walks out of the class with at least on idea of something to try in Dynamo. Happy Reviting!