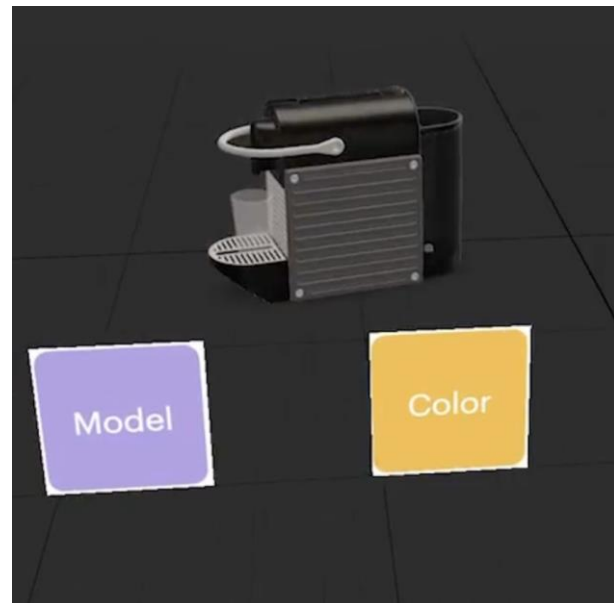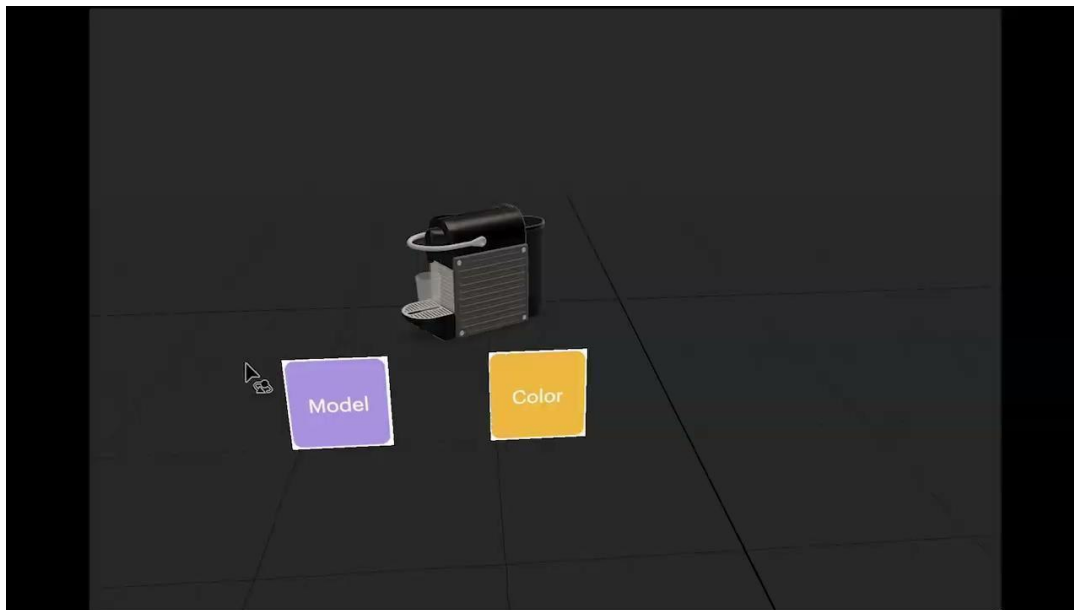# Interactivity

Peter Martin

Interactivity

- glTF as-is *currently* handles static content

- Interactive use cases currently hard code on a per-application basis.

- **Problem:** Interactive content is not portable!
  - Impossible for shared content between runtime engines
  - Difficult (at best) for interoperability workflows

Interactivity: High Level
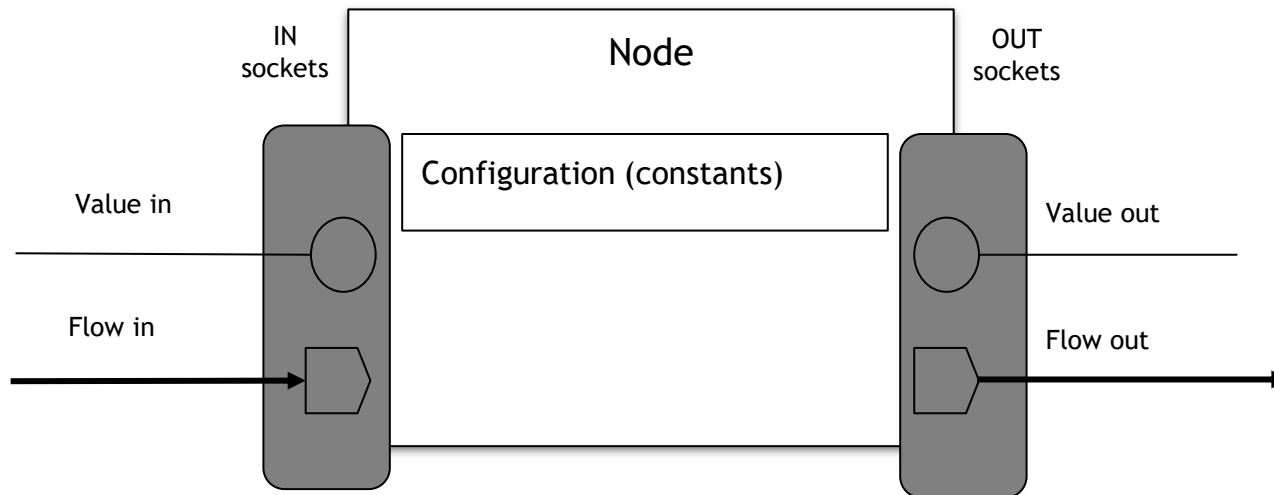

This new glTF extension:

- Provides node-based standard for interactivity (static geometry + behaviors)
- Empowers development of simple interactive applications
    - (Games, Education, Design Review, e-commerce…)

Interactivity: Principles
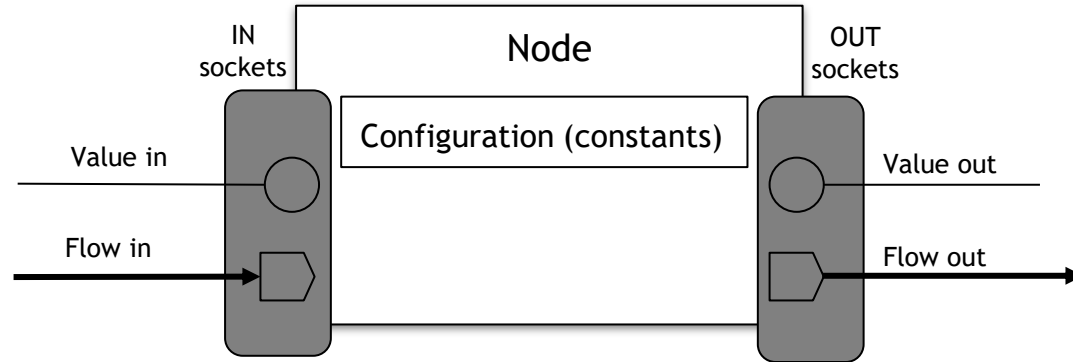
An interactivity Graph:
- set of connected Nodes
- Directed Acyclic Graph

All serialized as glTF extension JSON **-> (events, nodes, types, variables)**

IN sockets

Node

OUT sockets

Configuration (constants)

Value in

Value out

Flow in

Flow out

Interactivity: Node Categories

- **Math Nodes**
  - Arithmetic, Comparison...
- **Type Conversion Nodes**
- **Control Flow Nodes**
  - Ex: For loop, Branch
- **State Manipulation Nodes**
  - Variable
  - Pointer
    - (via KHR_animation_pointer)
  - Animation Control
- **Event Nodes**
  - Lifecycle Event Nodes
    - Ex: On Start, On Tick
  - Custom Event Nodes (user-defined)

IN sockets

Node

OUT sockets

Configuration (constants)

Value in

Value out

Flow in

Flow out

Interactivity: Limitations

For Security, Portability, Ease of Implementation:

- No dynamic allocation
    - no object instantiation
    - no array variables
    - no dynamic strings
- No network access
- No file system access
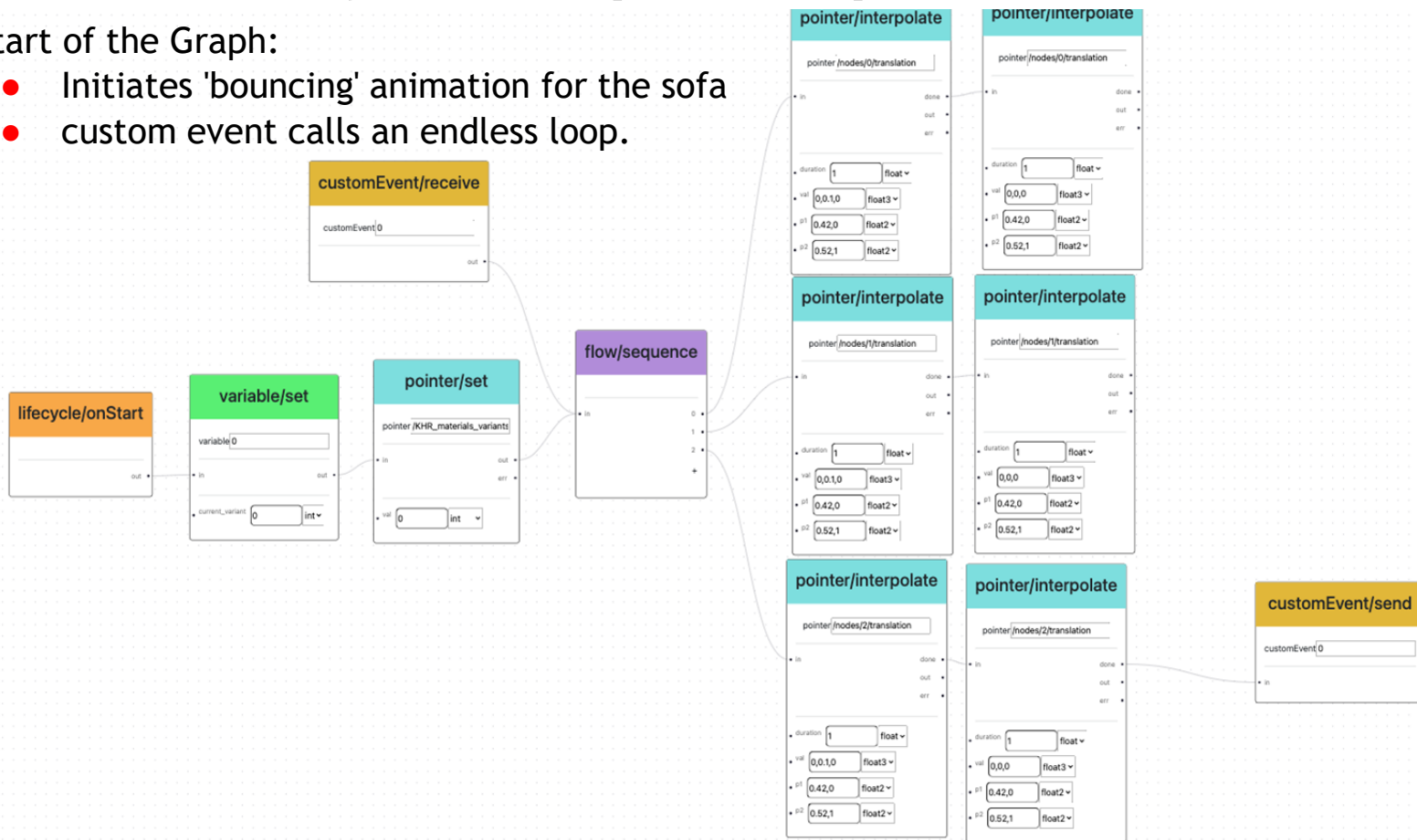- No multi user
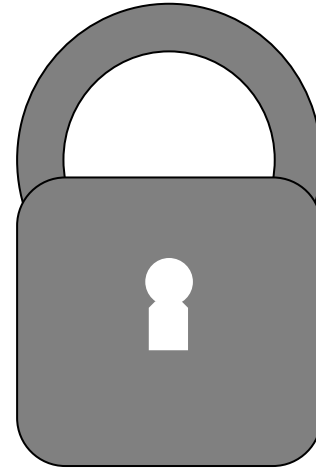
Interactivity: Example Graph

- 3D sofa that bounces in a looping 3D animation, spinning and displaying a new variable whenever you click it.
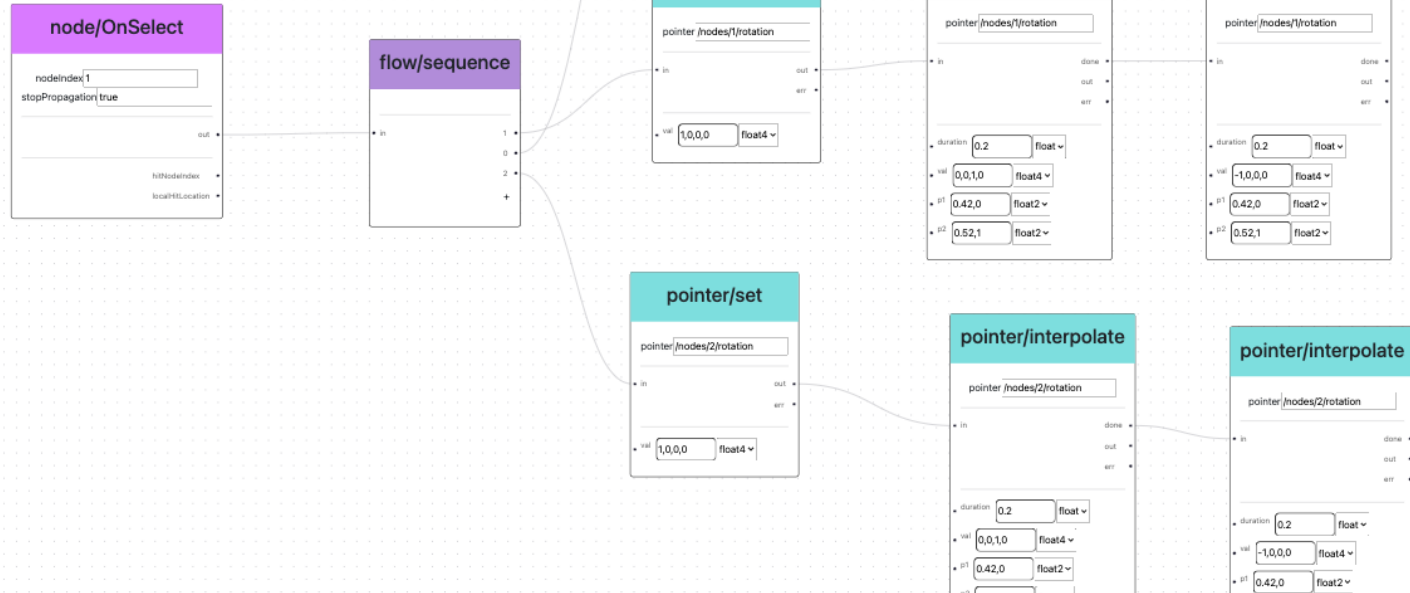
Interactivity: Example Graph

Start of the Graph:
- Initiates 'bouncing' animation for the sofa
- custom event calls an endless loop.
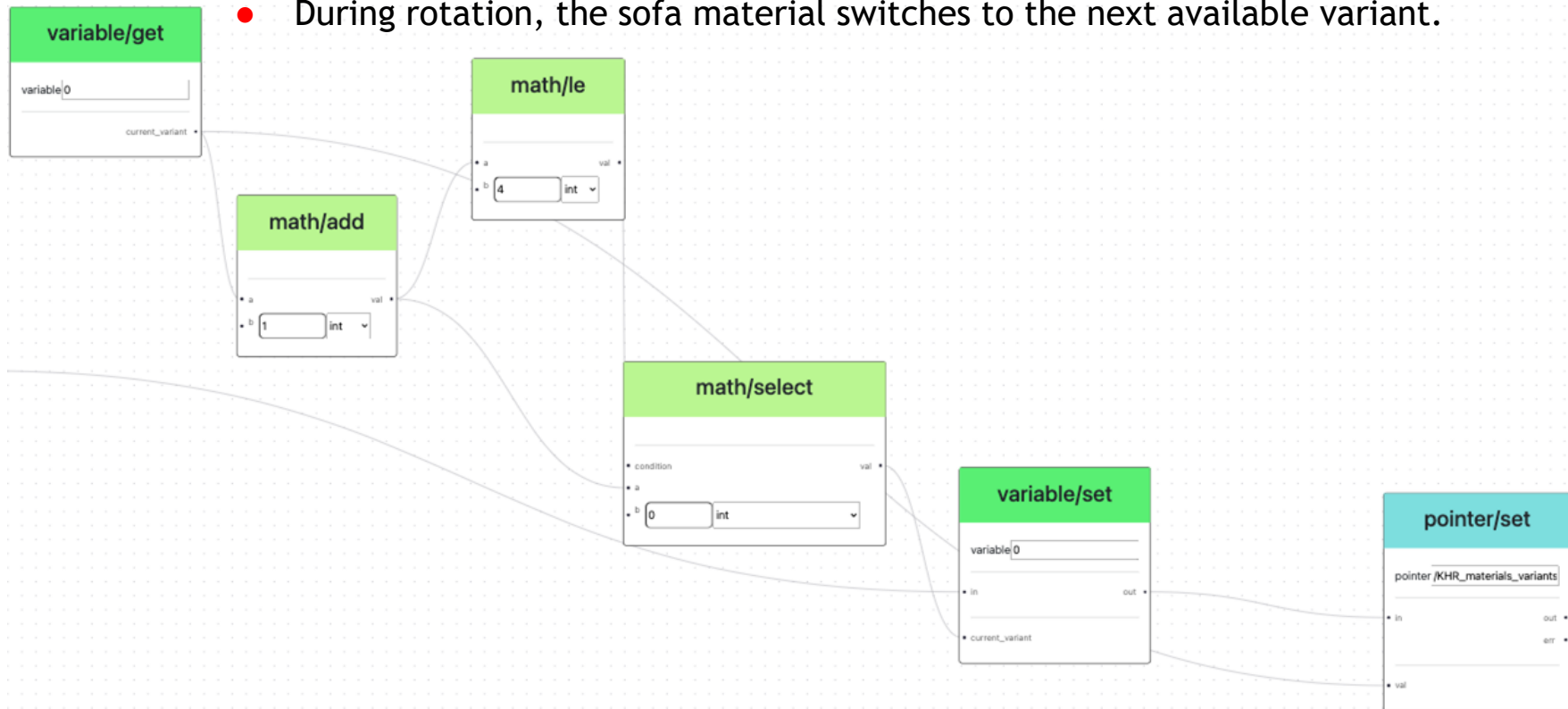
Interactivity: Example Graph

Fabric Clicked:
- node/OnSelect trigger
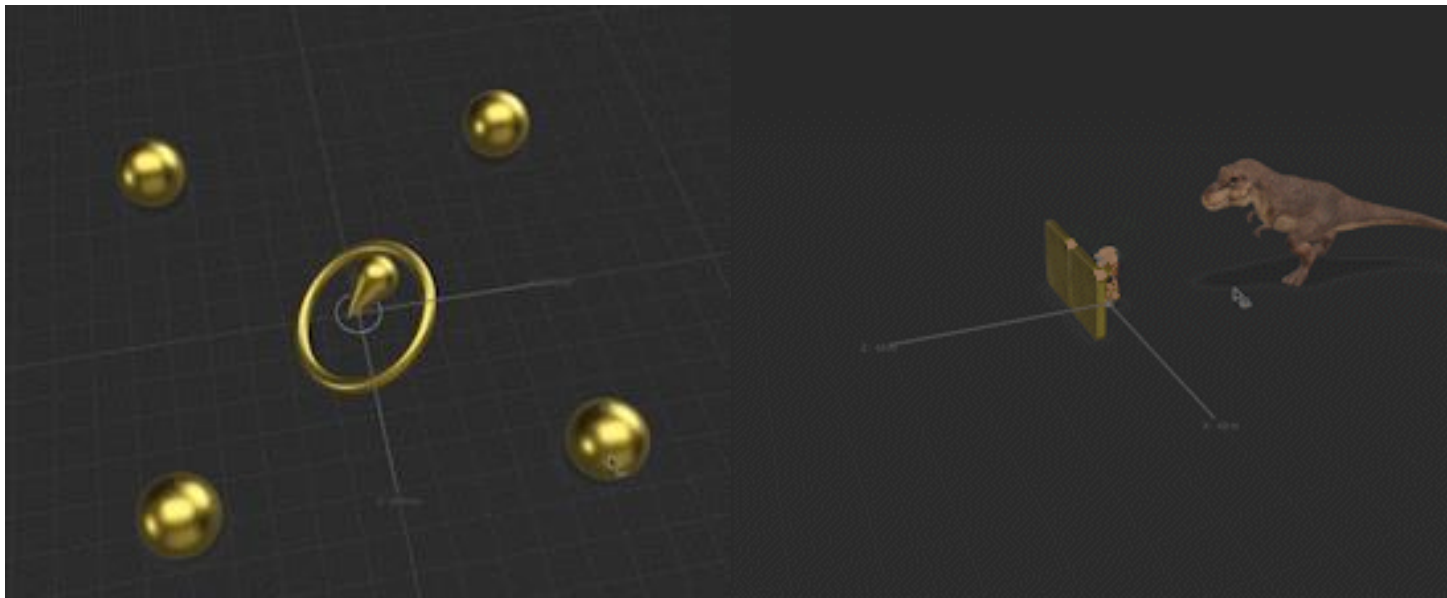- the sofa undergoes a 360-degree rotation

Interactivity: Example Graph

Next Variant:

- During rotation, the sofa material switches to the next available variant.

Interactivity: Examples

Interactivity: Resources & Getting Involved

- Invitation for Public Comments ([blog post](#)) issued in June
- [Draft Specification on Github](#)
- Leave feedback on the [Khronos GitHub pull request](#)
- Check out the Khronos [webinar](#) on interactivity
- Explore the [glTF Interactivity Graph Authoring Tool](#), a work-in-progress DCC React App
    - open source, public implementation
- Several companies actively working with standard (Adobe, Amazon, Google)

All Resources can be found from blog post: