Virtual Environments for Communicating Changing Forests

Michael J Mahoney  
mjmahone@esf.edu

Colin M Beier  
cbeier@esf.edu

Aidan C Ackerman  
acackerm@esf.edu
About Me

• Mike Mahoney
• PhD Candidate at SUNY-ESF
• Focusing on visualization, VR and ML as ways to think about large-scale systems
• These slides: mm218.dev/femc2022
What’s a virtual environment?
Using Tree Modeling Applications and Game Design Software to Simulate Tree Growth, Mortality, and Community Interaction

What’s the problem?
Missing elements:

1. Reusability

2. Reproducibility

3. Replicability
What are we doing about it?
library(sf)
library(unifir)
library(terrainr)

first_run <- makeUnity(
  "ifs_scene",
  "elev.tif",
  "texture.png",
  side_length = 257,
  scene_name = "first",
  action = FALSE
)

first_run ▶
importAsset("anim") ▶

InstantiatePrefab(
  scene_name = "first",
  prefab_path = file.path("Assets", first_trees$model),
  x_position = first_trees$X,
  y_position = first_trees$Y,
  z_position = first_trees$Y,
  x_scale = first_trees$scale,
  y_scale = first_trees$scale,
  z_scale = first_trees$scale
)

addDefaultPlayer(
  scene_name = "first",
  x_position = 245,
  y_position = 535,
  z_position = 32
)

saveScene(scene_name = "first") ▶
setActiveScene(scene_name = "first") ▶
action()
Beech bark disease: spatial patterns of thicket formation and disease spread in an aftermath forest in the northeastern United States

Lisa M. Giencke, Martin Dovčiak, Giorgos Mountrakis, Jonathan A. Cale, and Myron J. Mitchell

```r
read.csv("~/data/ifs_all_data.csv") |> head()
```

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<th>NORTH</th>
<th>ELEV</th>
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Thank you!
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Find me online:
- mm218.dev
- / @mikemahoney218
- @MikeMahoney218@fosstodon.org

Slides available at mm218.dev/femc2022