

(AR)ails

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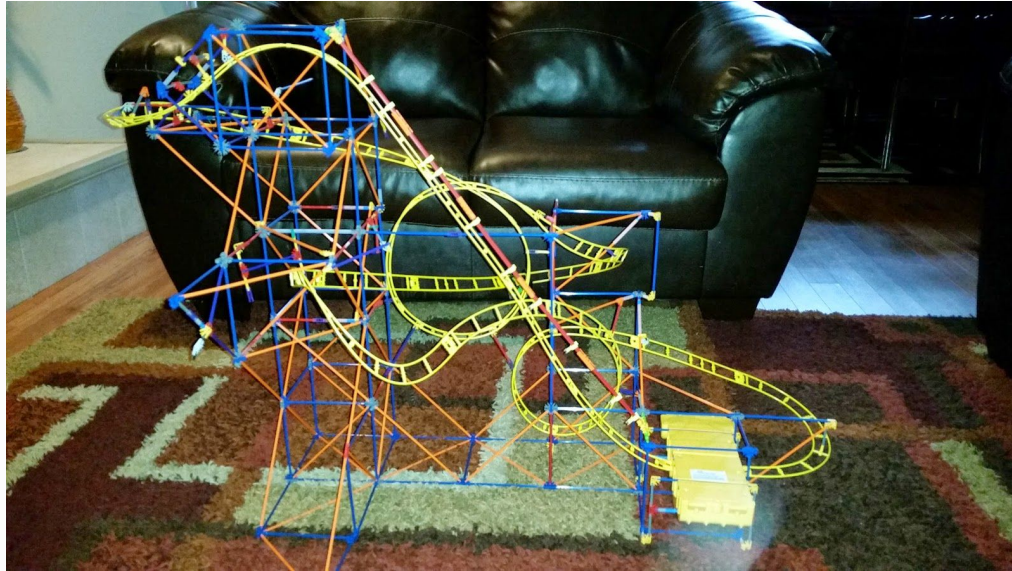


Problem Space / Motivation

- Computer games
 - Constrained to a 2D projection without VR or 3D glasses
 - Cannot involve the environment (cannot “build” in your living room)
- Actual train/roller coaster sets are:
 - Constrained by physics
 - Cleanup required, hard to save, relocate, or share (usable) creations
 - Potentially small pieces (choking hazard for kids and pets, painful to step on, easy to lose)
 - Require a clear area
 - Constrained by what pieces you have purchased
- Related “Work”
 - Digital: Rollercoaster Tycoon, Train Simulator, NoLimit, Mario Kart
 - Physical: Hot Wheels, Kinex, marble runs, real roller coasters

Our project

An Augmented Reality game to build tracks and simulate vehicle motion within the current physical environment.



Example Scenario 1

George and his daughter, Rachel, are spending a day together. Both of them put on their hololens units, and build a roller coaster. George starts in the living room, while Rachel builds in the kitchen. Their two designs meet up in the hallway, and they get to watch their roller coaster zoom around the pots and pans, dip into the sink, corkscrew through the hallway, and glide to a stop on the couch. As a bonus, when friends come over later in the evening, there is both no need to clean up, and they can also show off their creation.

This scenario highlights the potential of multiplayer creation, allowing the two to create one gigantic roller coaster, working on separate parts in the same location.

Example Scenario 2

Hannah is stuck inside on a rainy day. Instead of turning on the TV, she puts on her hololens, and builds several roller coasters in her living room. As she finishes each, she sends them to her friend, Elise, who tries them out at her place. Elise responds with some designs of her own, and they spend the afternoon making crazier and crazier designs, even working simultaneously on the same coaster.

This scenario highlights the sharing potential of our application, not only allowing the girls to send each other roller coasters to play with, but also allowing them to simultaneously edit the same coaster, from geographically separate locations.

Example Scenario 3

John and Cindy are moving into their new house, and have lots of boxes to unpack. While working, they take frequent fun breaks, and take turns building up a roller coaster around and through all the boxes. As boxes get moved around, and removed to their ultimate locales, more and more of the coaster gets revealed. In the middle of all this, the furniture arrives, and gets put into the room.

This scenario highlights the potential for our coasters to take into account the layout of the room, and adapt to the presence/absence of boxes and furniture. As the couple continues moving in, the coaster adjusts to work with the new room (portaling through a newly placed couch, for instance)

Example Scenario 4

Josh and Lula, twins and sibling rivals, are pretty competitive in all things. After getting a Hololens for Christmas, they quickly discover our roller coaster application. Playing around, they learn they can compete in building, in a variety of ways. First, they each compete to build the (long|tall|curvi)est coaster given 20 minutes each. Next, they learn that they can race each other on tracks they've built, and proceed to challenge each other. When they get a second Hololens on their birthday, they can even race simultaneously.

This scenario highlights the potential for the building to serve as a platform for competition. This could include building contests, with various metrics, as well as some form of racing on tracks.

Features

- Place tracks
- Spatial mapping to place tracks within the room
- Simulate realistic motion along the tracks
- Spatial sound effects
- Texture and visual effects
- Allow multiplayer collaboration
- Stretch goals:
 - Racing
 - Additional track types and obstacles
 - 1st person perspective
 - Transferring tracks between locations

Timeline

Weeks 1-2 : Proposal and learning the technologies

Weeks 3-4 : Rapid Prototyping

Weeks 5-7 : Implementation

Weeks 8-9 : User Testing and Refinement

Week 10 : Ship and Present

Challenges

Designing an interaction for building

Adjusting the track to take into account the environment

Moving creations between rooms/locations

Designing ways for users to enjoy their finished creations

Resource Budget

\$100 - Buying related games for inspiration

\$40 + tax - [NoLimits](#) Rollercoaster simulation

\$50 + tax - [Roller Coaster Tycoon World](#)

\$868 - 3d models and textures

\$20 - Pocket size battery packs (mobile charging convenience)

\$12 - domain name

Thank you for listening!

Questions?