



Mesh Snapping (Master's Project)

Shot 16 - 17 | 0:56 - 1:01 | Software: Houdini

- Developed algorithm to ensure feet stay positioned precisely on the ground with the option to pull the character into the ground or lift off the ground with a consistent distance offset.

Roles: Mesh Snapping HDA Tool Development (VEX, Hscript)



Self-Collision Detection (Professional Project)

Shot 18 | 1:01 - 1:03 | Software: Houdini

- Developed algorithm that casts rays internally and checks orientation of intersected self geometry to determine if character has a self collision at that point, and if it does, then colors the intersecting point red.

Roles: Self-Collision Visualizer HDA Tool Development (VEX, Hscript)



External-Collision Detection (Professional Project)

Shot 19 | 1:03 - 1:07 | Software: Houdini

- Developed algorithm that casts rays internally and checks orientation of intersected external geometry to determine if character has an external collision at that point, and if it does, then colors the intersecting point blue.

Roles: Self-Collision Visualizer HDA Tool Development (VEX, Hscript)



Balloon (Master's Project)

Shot 20 | 1:07 - 1:13 | Software: Houdini, Davinci Resolve

- Procedurally modeled helium tank and balloon.
- Created Vellum simulation setup that could be triggered to inflate balloon on user-defined start frame.

Roles: Modeling, Layout, FX, Lighting, Lookdev, Color



Rats (Master's Project)

Shot 21-24 | 1:13 - 1:19 | Software: Houdini, Fusion, Davinci Resolve

- Wrote and directed a scene of rats having a toothpick sword duel, fighting for cheese.
- Procedurally modeled, rigged, and fur groomed characters.
- Manually keyframed every foot step to ensure feet connected with the ground properly.

Roles: Cinematography, Character Modeling, Fur Grooming, Rigging, Layout, Motion Editing, Lighting, Lookdev, Compositing, Color



Echoes of the Wild | Cinematography (Master's Capstone Project)

Shot 25 - 26 | 1:19 - 1:25 | Software: Houdini, Davinci Resolve

- As Director of Photography for my Master's Capstone Project, I meticulously planned every VFX shot in coordination with Director and Producer and executed that plan on the shoot.
- Scanned every scene's environment using photogrammetry to provide spatially accurate scene geometry to match every shot's scale with precision and accuracy.

Roles: Photogrammetry, Cinematography, Color



Echoes of the Wild | Flying Echoes Simulation (Master's Capstone Project)

Shot 27 - 28 | 1:25 - 1:31 | Software: Houdini, Davinci Resolve

- Collaborated with director to bring their vision for the flying echo creatures to life.
- Developed point-based to volume procedural system that enabled fine-tuning of the flying creature's behavior, all controlled by parameter interface inputs.

Roles: Cinematography, FX, Color



Collision Deformer (Personal Project)

Shot 29 - 31 | 1:31 - 1:36 | Software: Houdini, Fusion, Davinci Resolve

- Developed algorithm to detect collision depth as a compression value which drives the outward squish amount to maintain physically accurate volume with manual user controls.
- Optimized to run in realtime for fast iterations, and is much faster than simulation workflow.

Roles: Collision Deformer Tool Development, CFX, Lighting, Lookdev, Compositing, Color