CLOUDS AND RIMS

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Niko 2: Little Brother, Big Trouble

- Sequel for Niko And The Way To The Stars
- Budget of 7.3 million €
- Coproduction between Finland, Germany, Denmark, Ireland.
- About 1200 shots
Requirements for the clouds

- Fast rendering.
- Rendering happens in PrMan.
- Visualization in viewport for layout purposes.
- Recyclable cloud elements.
- Much bigger scale than in Niko1.
- Voxel resolution had to be fairly high (high in our scale!).
Modelling the clouds

- Part of the cloud elements were based on polygon models and others were procedurally generated.
- Volumetric displacement applied on top of base volumes to get billowing forms.
- Additional smear displacement was added on top to break up the initial forms.
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Lighting the clouds

- All lighting was baked in Houdini to voxels.
- One directional light and one environment light.
- Directional light was calculated with bakeVolumeSop.
- Cast shadows from set were added with volumeVop.
- Environment light was calculated from multiple point sources.
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Matte clouds

- The furthest clouds were rendered to matte planes in houdini.
- Cloud volumes were split into depth layers
- Fast to build new lightbakes.
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From Houdini to Maya & PrMan

- PythonSop took care of splitting big voxel grids into smaller grids and removing empty ones.
- same sop exported the voxels to prman RiVolume primitives.
- Proxy geo with lightbake vertexcolors was exported for layout.
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Rendering the clouds

- Each small voxel grid was rendered out as delayedReadArchive.
- Minimum calculations in rendering.
- Additional detail was added in shader.
- Memory challenges.
Building the mood

• Baked light was rendered out as separate channels.
  - R = keyLight
  - G = envLight
  - B = depthPass

• Recycling, different moods were built from same data in nuke.
Backlighting
Backlighting hardsurfaces

- Backlighting was essential visual tool in our film and shaders needed to support that.
- On characters fur and feather gave nice backlight and hard surfaces had to match that visually.
- We wanted to improve our snow shading from Niko1.
Wrap light

- Light response is wrapped behind the terminator.
- Problem with shadows.
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Shadow sampling offset

- Instead of sampling shadow from one shading point we sample along the surface normal.
Backlighting hardsurfaces

- Offset was done in lightShader.
- Offset settings are defined in surfaceShader and passed to lightShader.
- Materials can have unique sampling offsets and this can also be texture mapped.
Scattering with sampling offset

- Same technique used on different purpose.
- "Single scatter"
- Sampling along lightVector.
- Important to jitter along the offset vector.
Hit on rendertime?
Thanks!

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