CS5245 Project: Hunter Hunted

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Storyline and Effect

- A radioactive creature (Hunter) goes after a thief that takes away its belonging. Little did it realize that everything was staged and it was being hunted instead.

- 2 main effects:
  - Bridge demolition
 - Radioactive, fluid-like creature

- See main video

Effect 1: Bridge Demolition

- 1) Creation of CG bridge
  - Modeling
    - Measured actual dimensions of bridge and re-created a replica of the bridge in CG
    - Mostly modeled by lofting NURBS curves as cross-sections
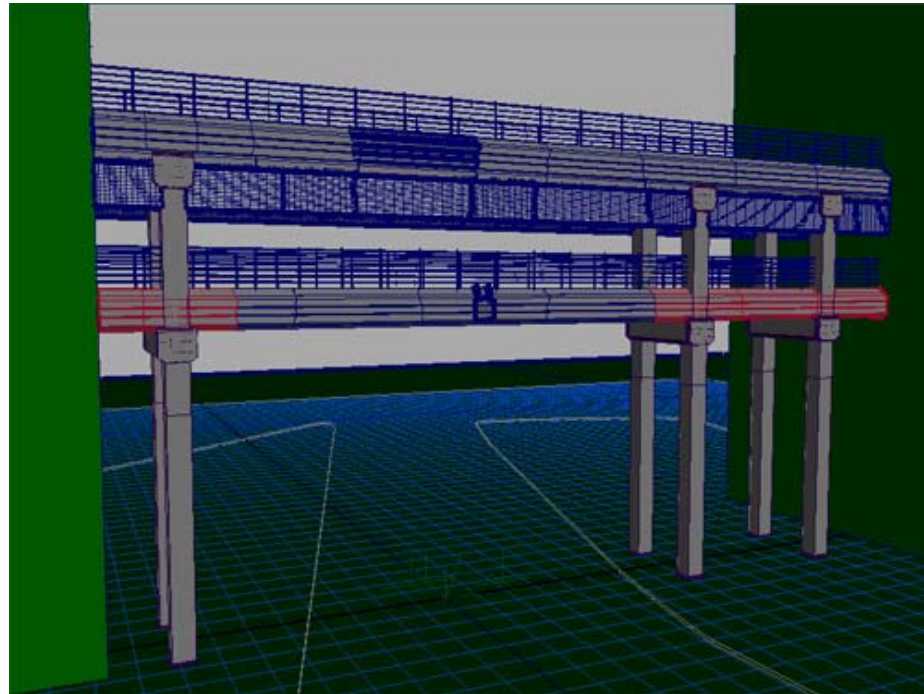
Effect 1: Bridge Demolition

- 1) Creation of CG bridge
  - Texturing
    - Textured using real material
      - Added in dirt to remove the clean CG look
    - Projection texturing techniques for tileable parts
    - Unwrap UVs for non-tileable parts
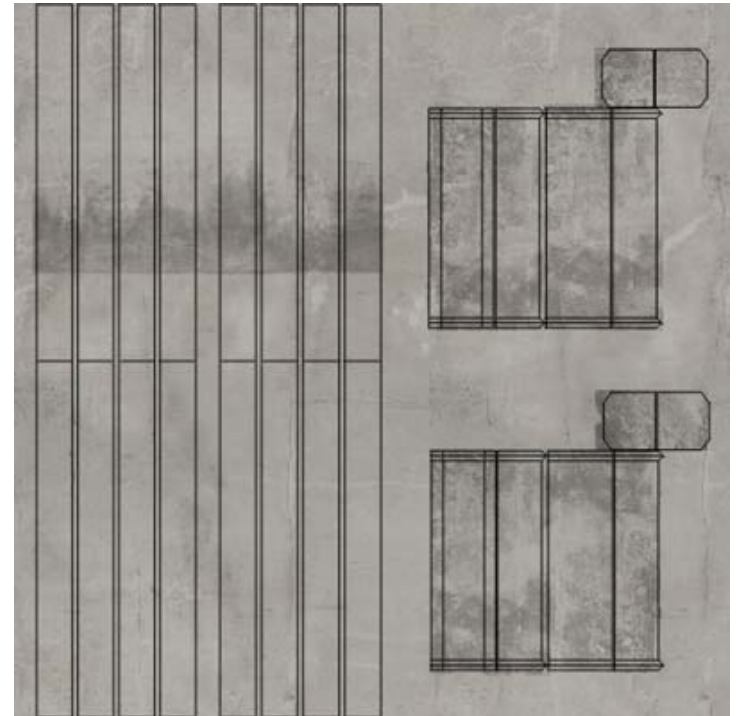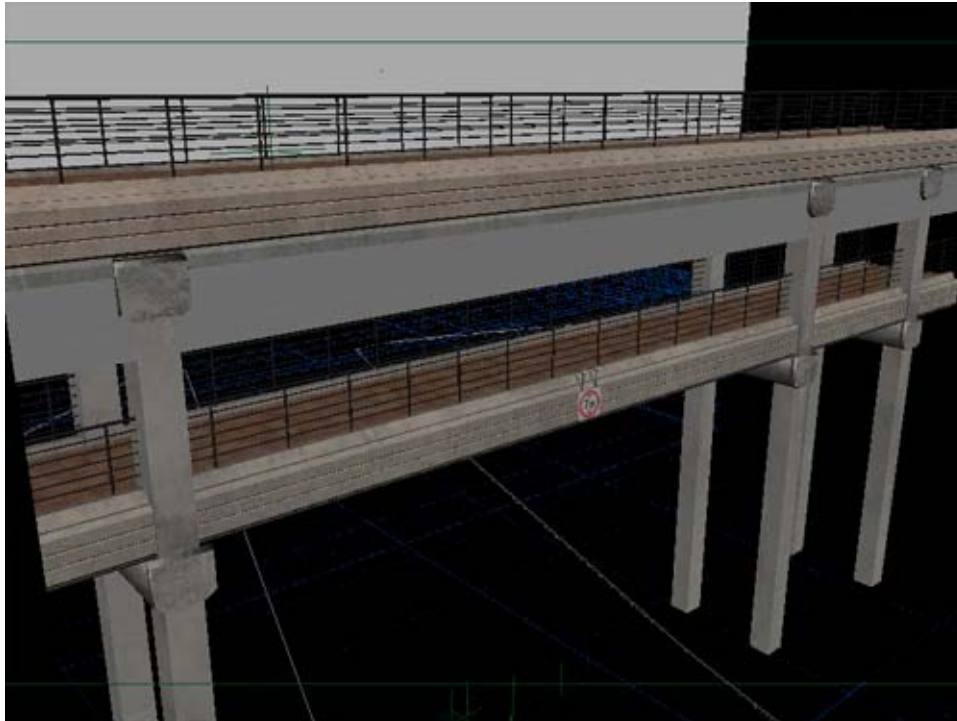
Effect 1: Bridge Demolition

- 2) Destruction of bridge
  - Created with a commercial Maya plugin called BlastCode
  - Pre-fracturing

    - Used fracture maps to pre-fracture the bridge
   - Sculpted each piece manually to remove regular edges
  - Animating:
    - Bridge pieces: Used rigid body dynamics to get accurate motion due to collision and forces
    - Railing: Used a combination of smooth binding and lattice deformers to achieve good deformation
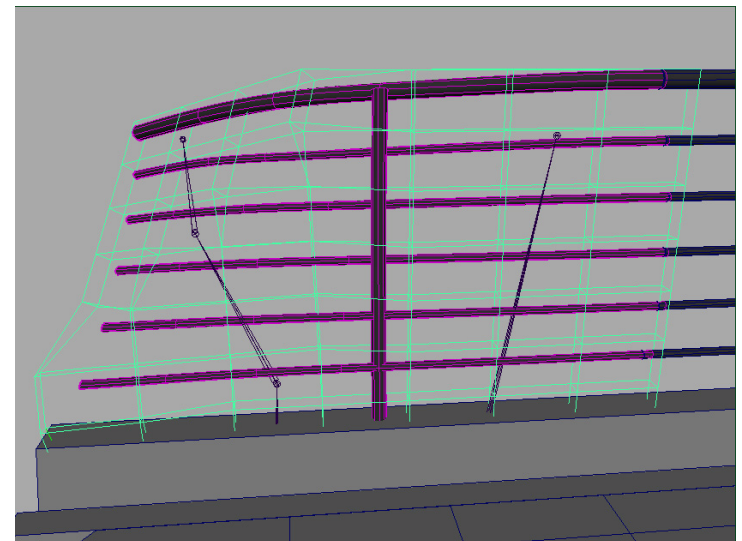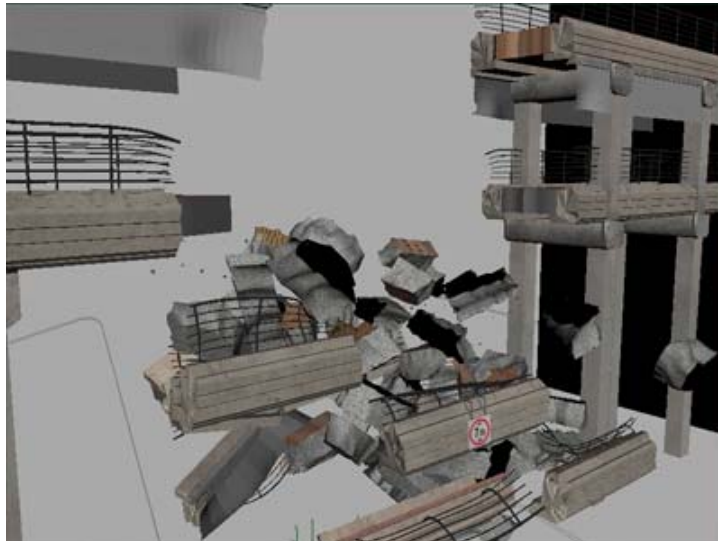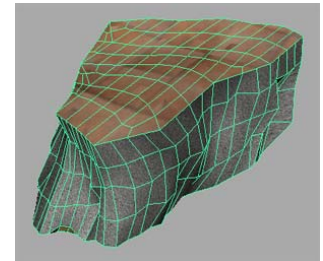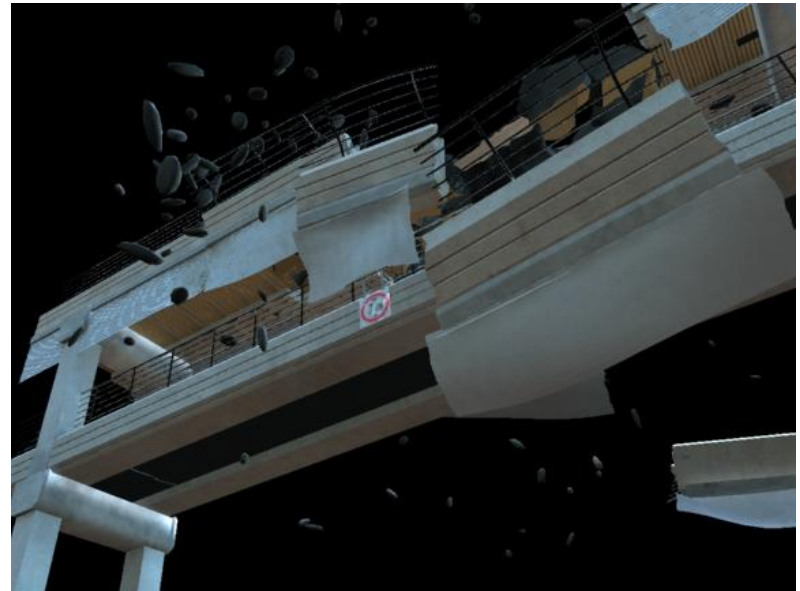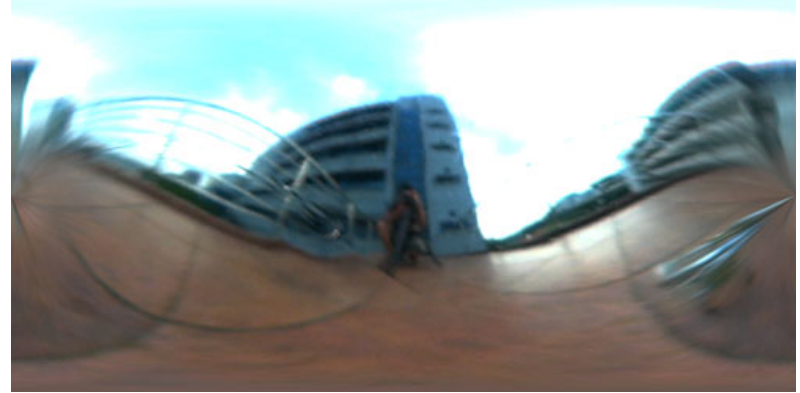
Effect 1: Bridge Demolition

- ## 3) Smoke, Fire, Debris, Dust
    - Used Maya fluid for fire and smoke
    - Used particle system for dust, dust trail and debris
        - Expressions to control particle look and behaviour
        - Used rock pieces as particle instances for the debris
        - Dust rendered as sprites
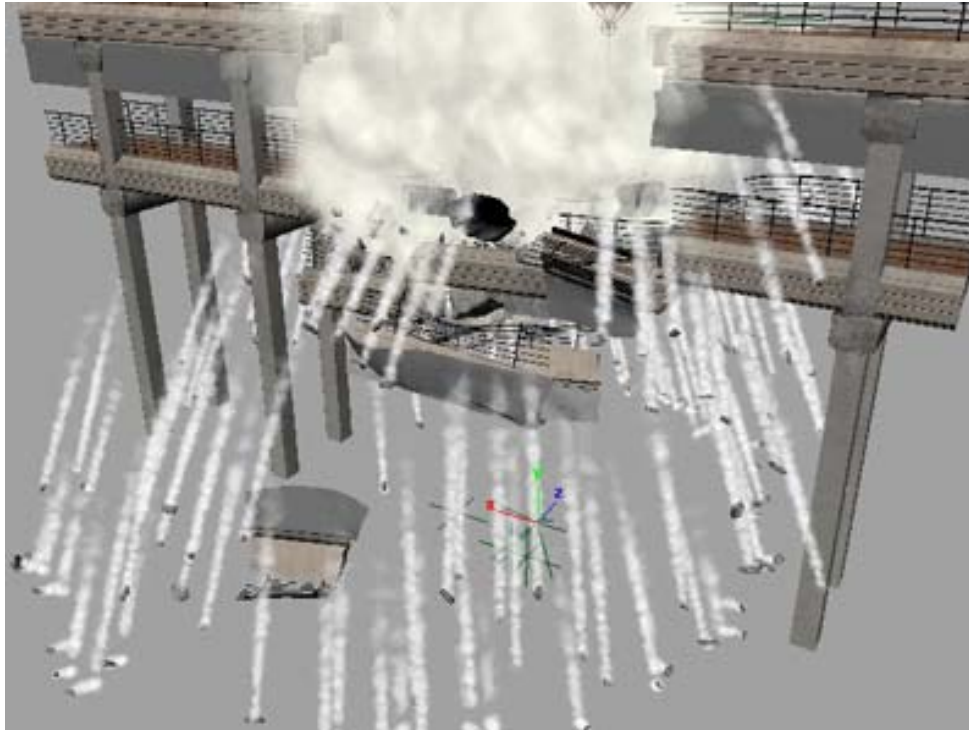
Effect 1: Bridge Demolition

- ☐ 4) Rendering
  - ■ Used HDRI captured from the actual day of shooting

  - ■ Rendered with Mental Ray using Final Gather

  - ■ Rendered out in different passes (shadow, color etc)

Effect 1: Bridge Demolition

□ 5) Compositing

- Compositing done in Nuke
- Manual frame-by-frame rotoscoping to separate supposed foreground elements from the superimposed CG background elements

- Composite different render passes (shadow, color etc)
- Color correction

Effect 1: Bridge Demolition

- **6) Removal of bridge from footage**
  - Initially tried to use an image in-painting algorithm but did not work well
  - Had to use Photoshop instead
  - Manually painted out the bridge on first frame of each scene requiring bridge removal

Effect 1: Bridge Demolition

- 6) Removal of bridge from footage
  - Use of Clone tool
    - Fill in portions from parts of original image
  - Use of reference photographs
    - Take photos of background from similar angles
    - Crop and skew/distort to fit background in footage
    - Contrast/Brightness & color correction
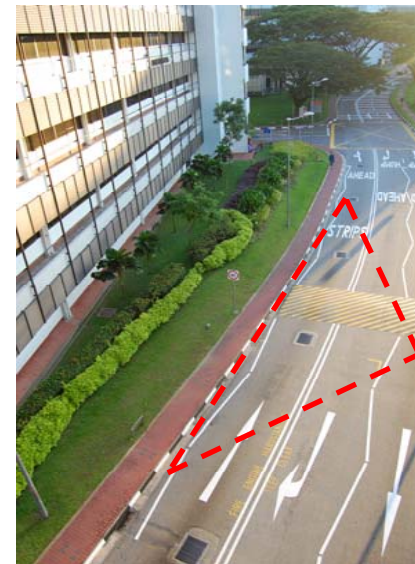
Effect 1: Bridge Demolition

- Final Result: Realistic demolition of S15-Soc1 bridge

Effect 2: Radioactive, Fluid-like Creature

- Initially wanted a well-modeled and textured creature
  - Too common in movies and not creative enough
- So we came up with a character that:
  - Moves with jelly-like body motion
  - Is translucent and is visible only due to the radioactive smoke around him

Effect 2: Radioactive, Fluid-like Creature

- ❑ Characteristic 1: Jelly-like body motion
  - ■ Creative and alternative use of a muscle system (Muskeelar) which we have created from scratch
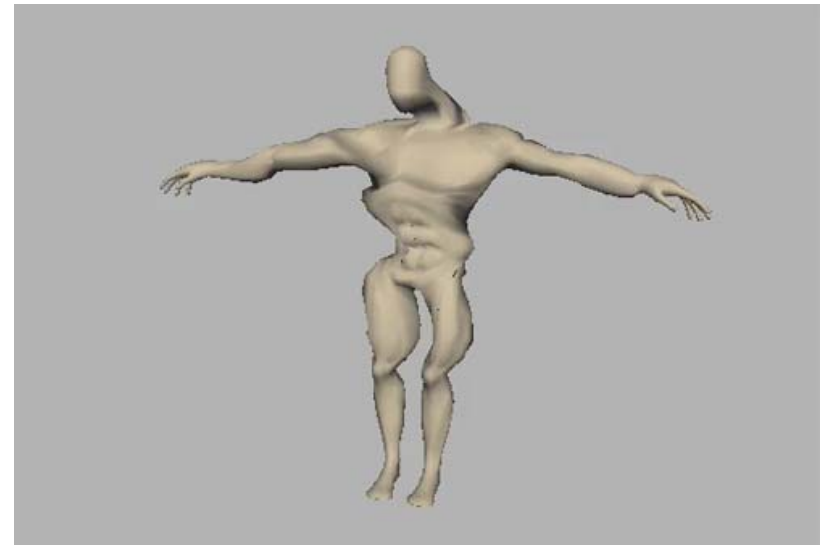   - ❑ Implemented as a plugin for maya
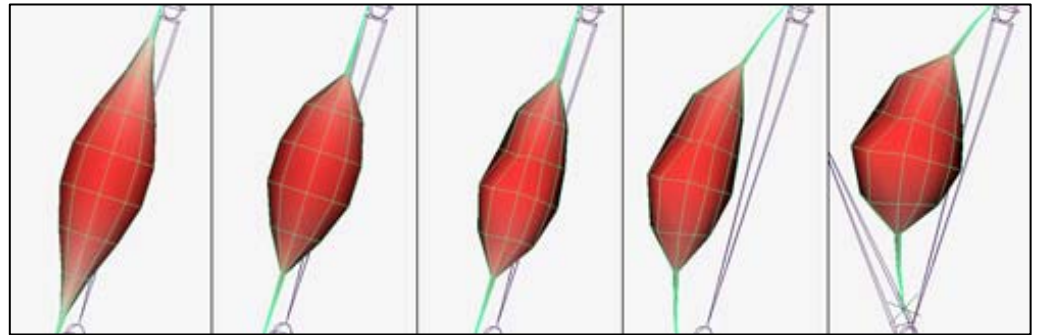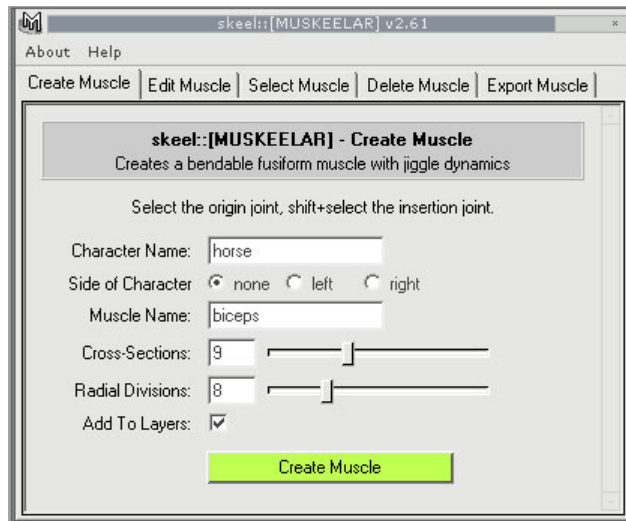
  - ❑ Fast dynamics simulation for muscle jiggles

Effect 2: Radioactive, Fluid-like Creature

- Created the muscles for the creature according to human anatomy
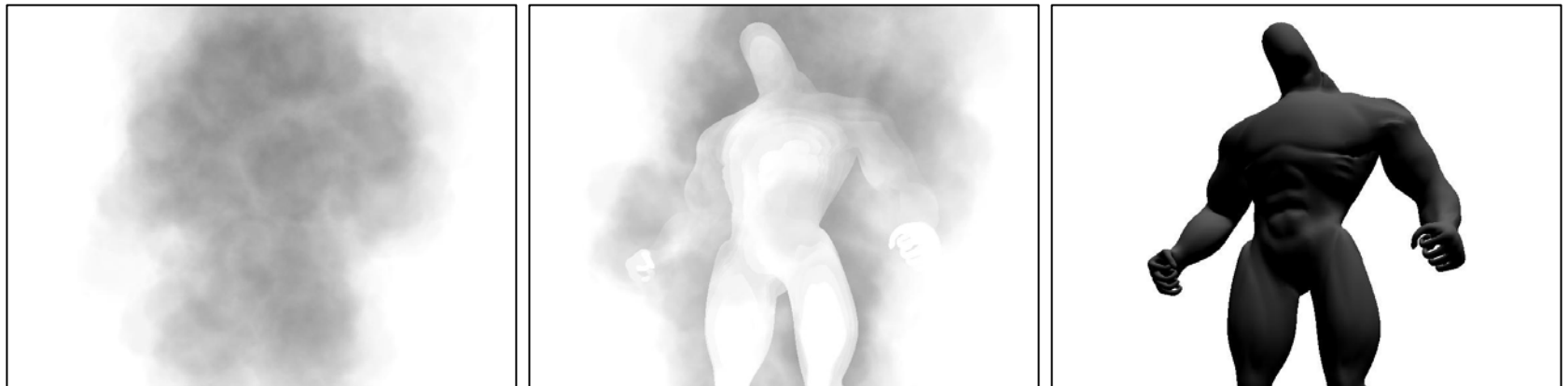

- Can get some fluid/jelly-like effects by setting low stiffness and damping to the muscles
  ([see testing clip](#))

Effect 2: Radioactive, Fluid-like Creature

- ❑ Characteristic 2: Translucent and radioactive look
  - ■ Used particle system with smoke texture applied on sprites
  - ■ Rendered with 3 passes:
    - ❑ Smoke only, Smoke with creature as mask, Creature only


  - ■ The Smoke-With-Creature-Mask layer is placed on top of the Smoke layer to get the "translucency" of the character
  - ■ Changed the colors to some dirty green
  - ■ Applied 2D distortion filter in compositing stage to get interesting refraction effect on the creature
    - ❑ Used the Creature layer as the displacement map

Effect 2: Radioactive, Fluid-like Creature

- Modeling
 - Concerned about copyright issues, so modeled out our own model
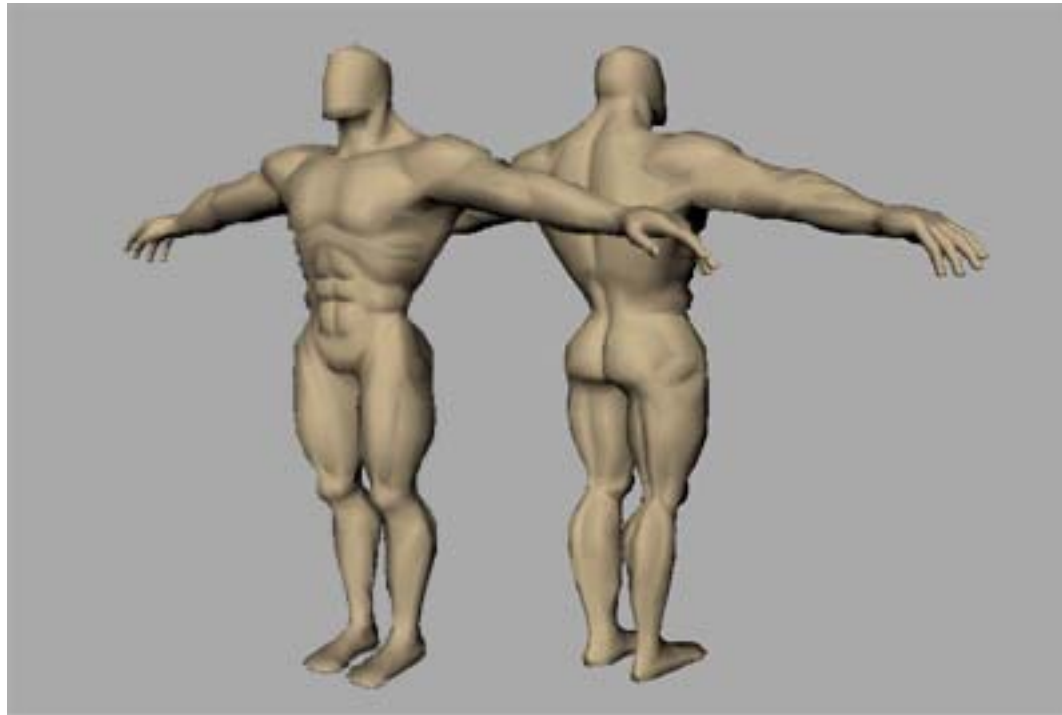
  - Followed anatomy for better musculature definition
  - Lower resolution → easier to skin
    - Subdivide after deformation

Effect 2: Radioactive, Fluid-like Creature

- Rigging and skinning
  - Clean joint hierarchy setup
  - Animation controls with automatic rigging scripts written in MEL
    - IK-FK switches
    - Auto-clavicle
    - Reverse foot rig etc

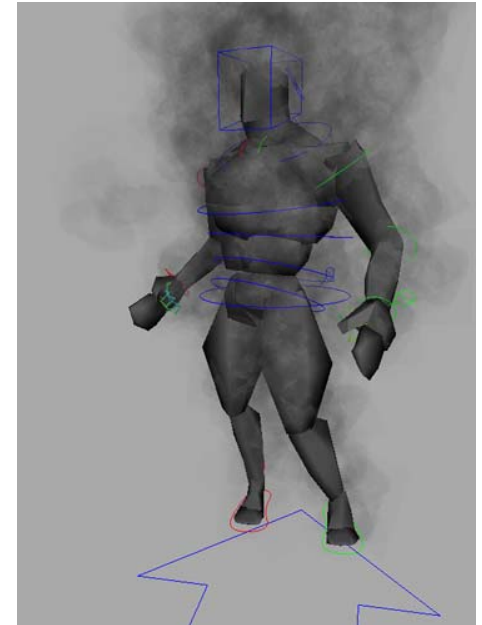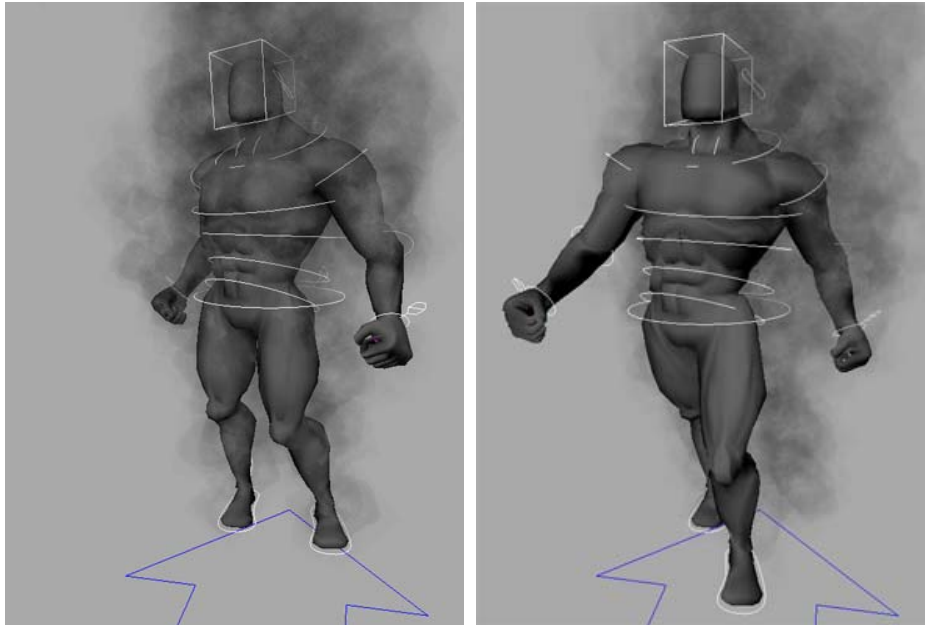 - Painting of joint and muscle weights
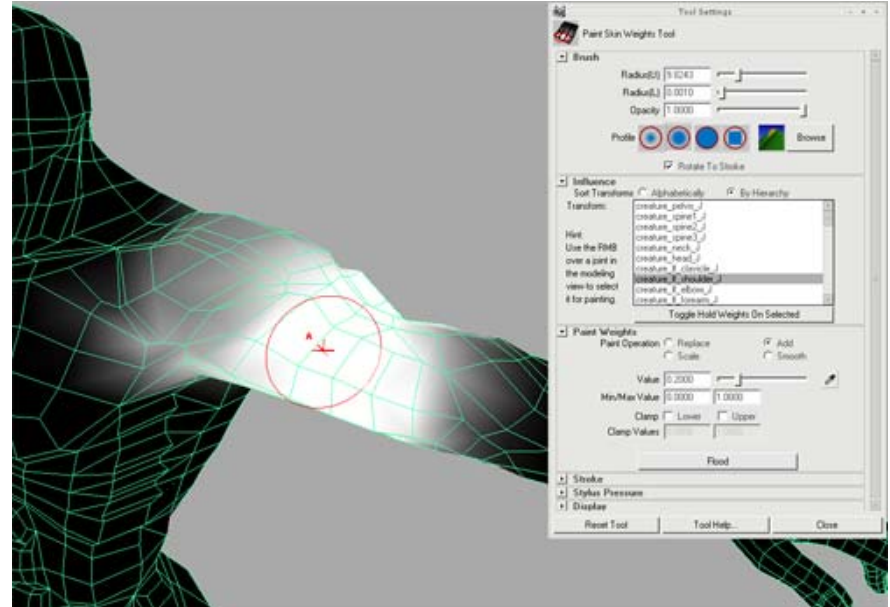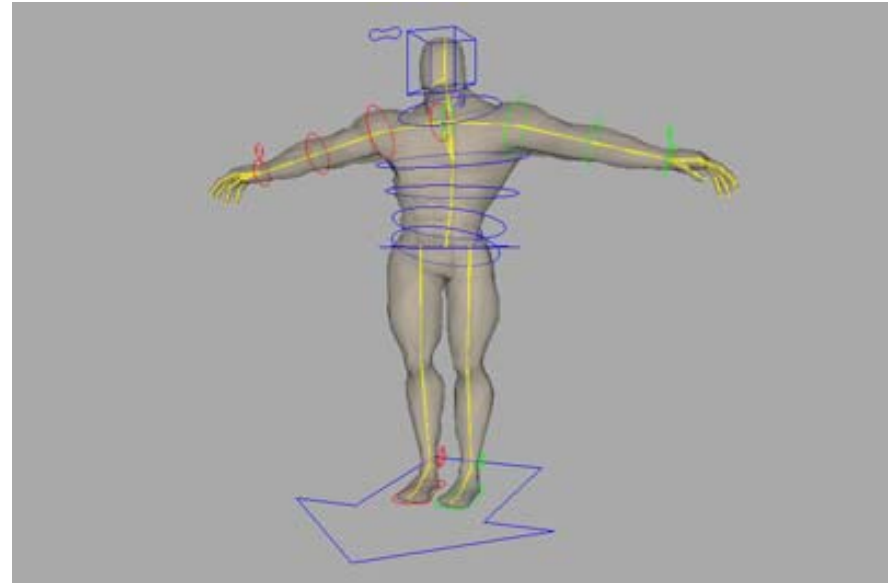
Effect 2: Radioactive, Fluid-like Creature

- Animation
  - Pose-by-pose keyframing

  - Used low resolution proxy for faster playback

  - Followed animation principles for more believable motion

Effect 2: Radioactive, Fluid-like Creature

- Final Result: Interesting fluid-like character
    - Hopefully unseen in movies yet

Additional Things Done

- Pre-visualization ([view clip](#))
  - The animated version of our storyboard

  - Extremely useful throughout the production process because it allowed us to get:
    - The correct camera angles before the actual shoot
    - The timing and feel of the video right before the actual shoot
    - The animation of the creature right
- Sound and music are included to provide a complete visual and audio package