Introduction

CS5245 Vision & Graphics for Special Effects

Leow Wee Kheng

Department of Computer Science
School of Computing
National University of Singapore
Digital Special Effects

Digital special effects (DFX) have revolutionized media industry.

- Artists can create visually stunning DFX.
- DFX is used in nearly every production.
- Many DFX companies have appeared:
  - Industrial Light & Magic (US)
  - Realviz (US)
  - Rhythm & Hues (US)
  - Weta Digital (New Zealand)
  - and many more
What makes DFX interesting and captivating?

- DFX must look **realistic** and **believable**.
  - Example: *Forrest Gump* hand-shaking sequence.
  - Comments: *The Lord of the Rings* [LoR1], [LoR2]

- DFX must blend into the real scene **seamlessly**.
- Good DFX is one that viewers do not realize it’s there.
  - Example: *Harry Potter* flying camera sequence.
  - Comments: *The Lord of the Rings* [LoR2]

- “add story-telling elements, but erase the tracks”
Digital Special Effects

DFX are created using DFX elements:

- **Real visual elements:**
  video or film footage of real scenes, actors, objects, motions, actions, natural phenomena, etc.

- **CGI (computer-generated imagery) elements:**
  Computer Graphics (CG) scenes, characters, objects, motions, actions, natural phenomena, etc.

- **Audio elements:**
dialogue, sound effects, music.
Difference between DFX and Computer Animation

- Computer animation involves only CGI elements. DFX involves real visual elements, and sometimes CGI elements also.
- DFXs require the CGI elements to look *realistic*. Computer animation can look like *cartoon*. 

(a) Cartoon character. (b) Realistic character.
Production Process

Three stages of media production [Kel00, KM01]:

1. Preproduction
2. Production
3. Postproduction

Good learning examples:

- *The Lord of the Rings DVD, Appendices.*
- *Forrest Gump DVD Disk 2: Behind the Magic of Forrest Gump.*
Preproduction

Preparation stage:
- Project proposal: summary used to sell project
- Premise: concise statement of story
- Synopsis: short description of basic story line
- Treatment: plot summaries in short-story form
- Scripts: production guides on paper, what will be seen or heard in finished product.
- Budget: how fund will be spent
- Storyboard: graphic visualization of shot sequence
Production

Begins with design, setup, rehearsal:

• Conceptual design: artistic concepts of visual elements in pencil and paper and small sculptures
• Set construction: construct set, miniatures, etc. set up stage, cameras, lighting, rigs.
• Document the set: for use in creating special effects
• Props construction: construct props, prosthetics, etc.
• Costume design: design and make costumes
• Rehearsal: rehearse dialogues, moves, etc.
Production

Visual production:
- Live shoot: shoot actors, scenes, etc.
- Create CG models: create CG models of characters and scenes.
- CG animation: animate CG models of characters

Audio production:
- Music scoring: compose and score music
- Music recording: perform and record music
- Sound recording: create and record sound effects, re-record dialogue.
Postproduction

After visual and sound elements have been recorded:

- Compositing: compose various DFX elements into the live footage
- Film editing: edit footages into a locked footage
- Sound mixing: add dialogue, sound effects, and music into the locked footage to produce the final footage
Traditionally sequence [KM01]:

1. Storyboard
2. Live shoot
3. SFX
4. Compositing
5. Film editing
6. Sound recording
7. Sound mixing
8. Music recording
9. Final product
Production Process

- Contemporary sequence, e.g., *Lord of the Rings* [LoR6]

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Storyboard

Live shoot

Animation

Sound recording

Film editing

Music recording

Sound mixing

Compositing

Final product
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Summary

- Media production involves a lot of creative talents.
- 3 stages: preproduction, production, postproduction.
- In this course, we shall focus on
  - Storyboarding
  - Camera and lighting
  - Digital compositing
  - Algorithms that facilitate creation of DFX
References


