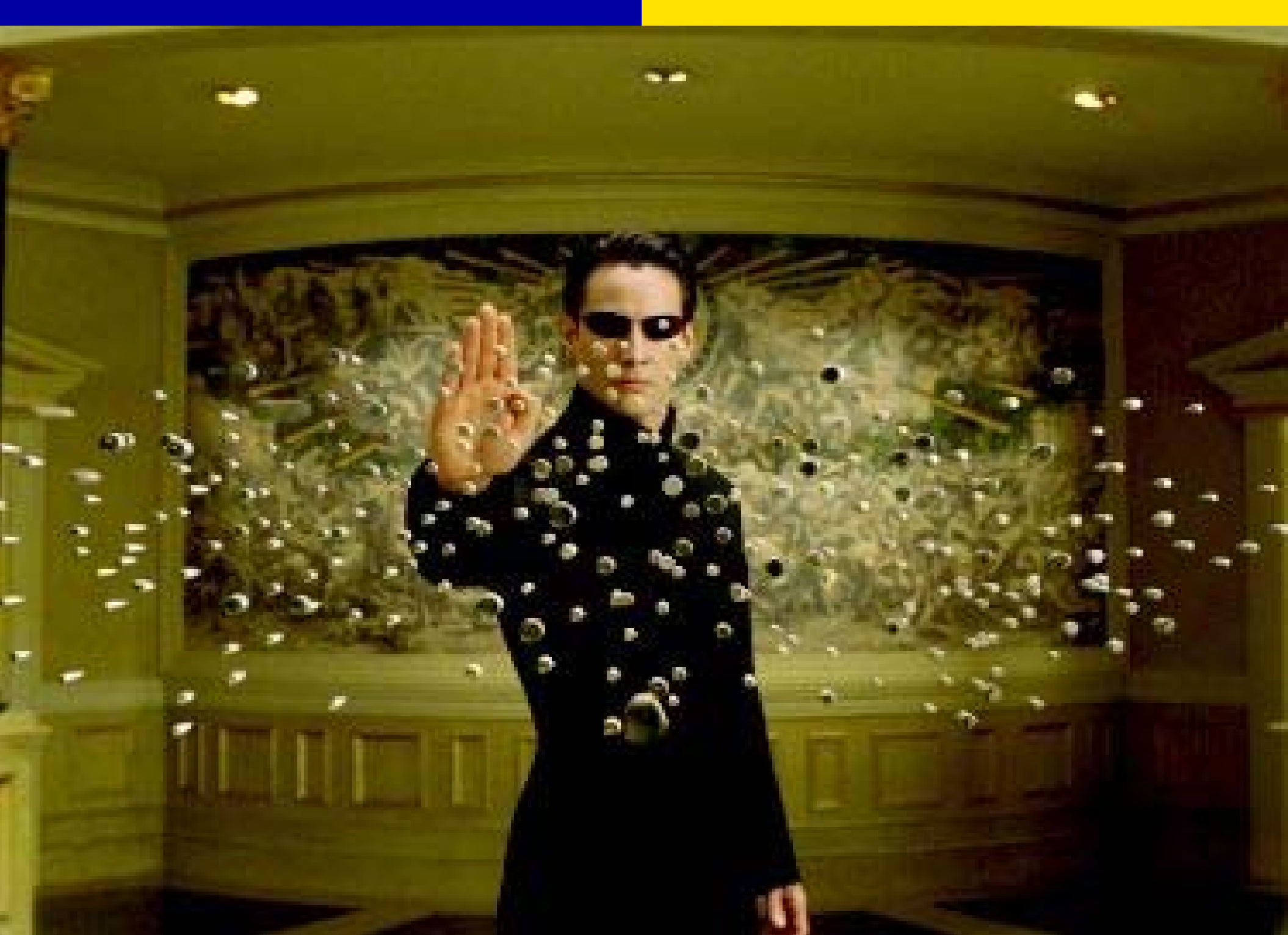


Introduction

CS5245 Vision & Graphics for Special Effects

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THE LORD OF THE RINGS
THE RETURN OF THE KING

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

Digital Special Effects

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:

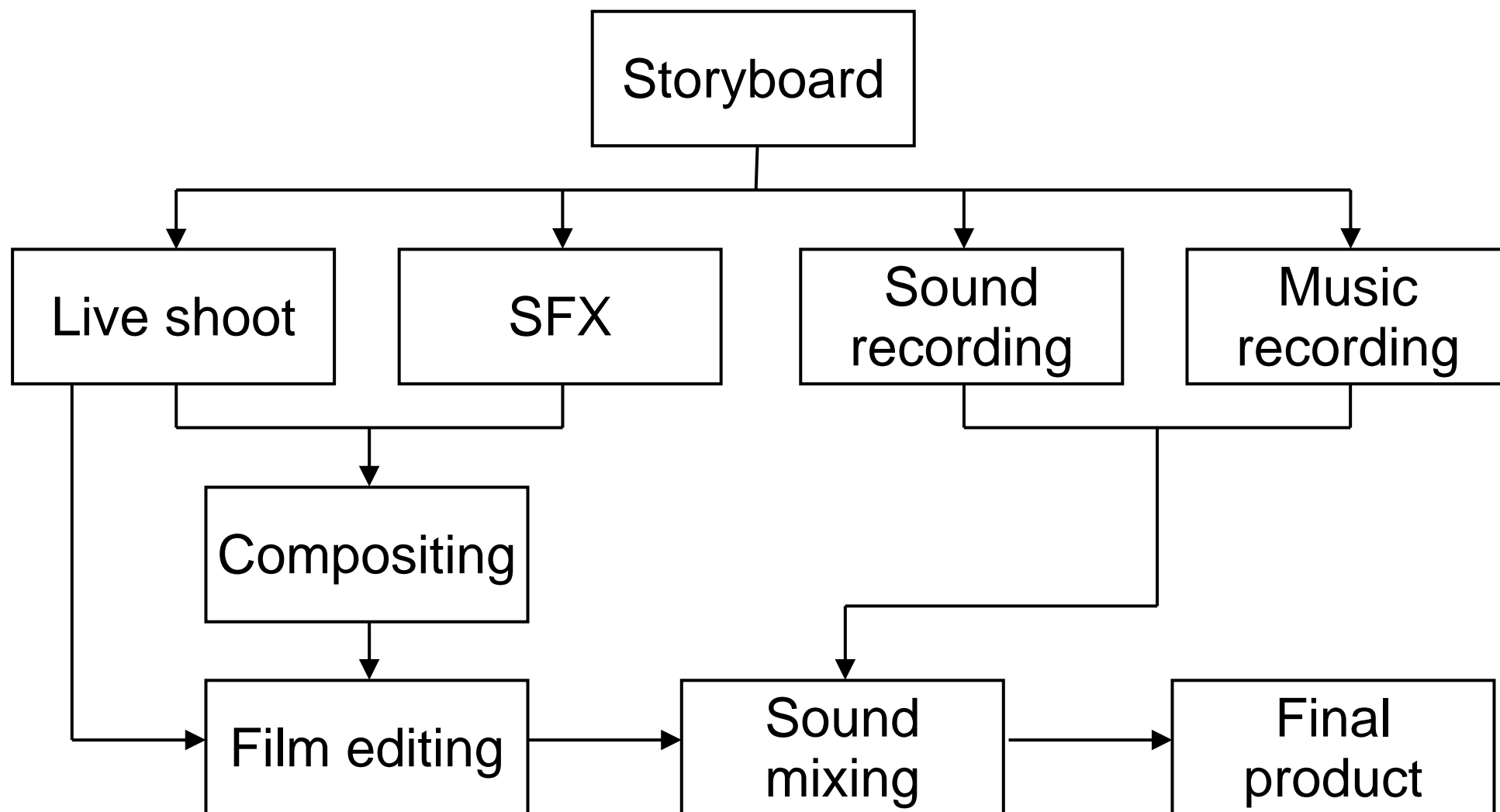
- Music scoring: compose and score music
- Music recording: perform and record music
- Sound recording: create and record sound effects, re-record dialogue.

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

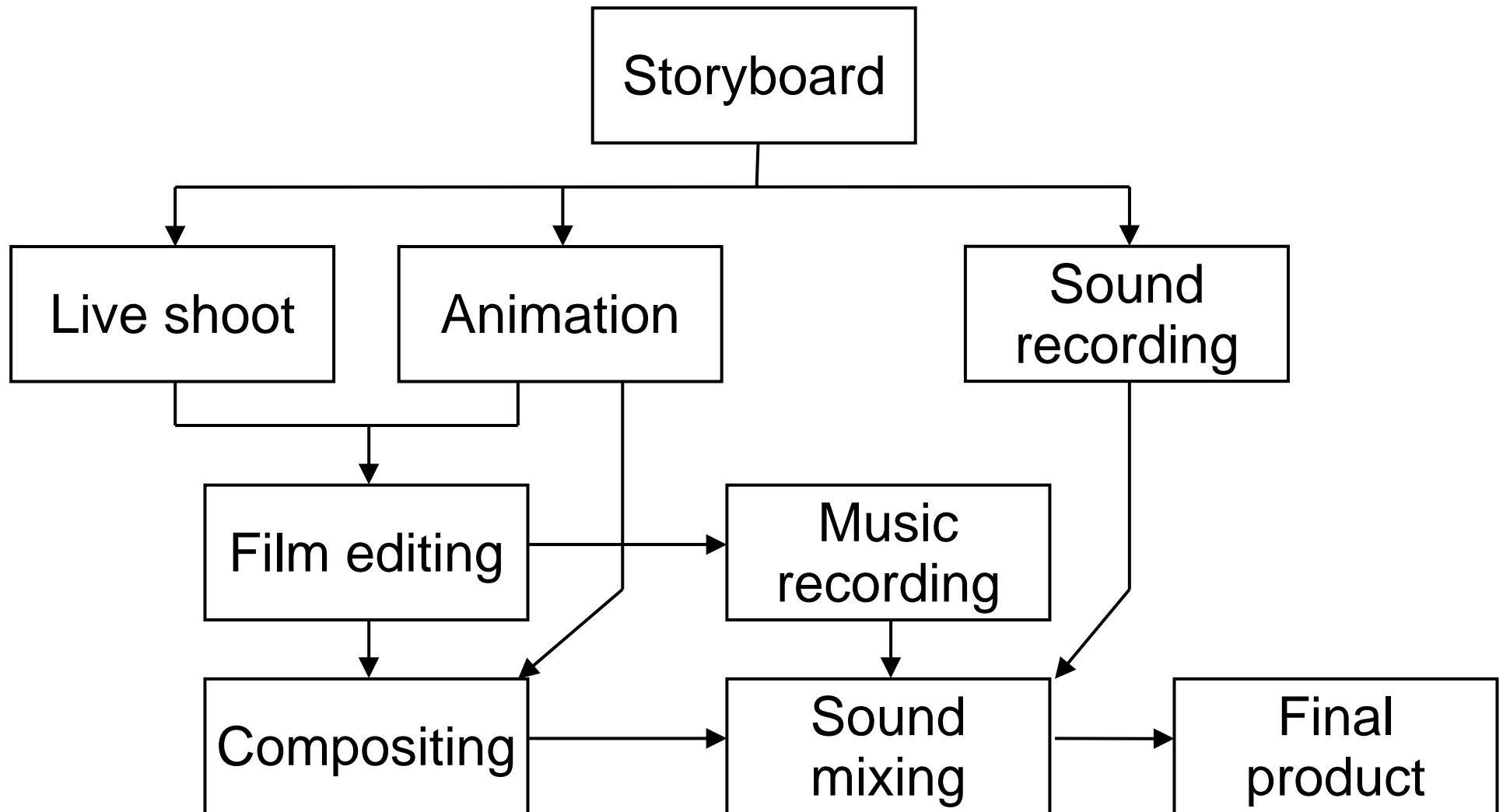
Production Process

- Traditionally sequence [KM01]:



Production Process

- Contemporary sequence, e.g., *Lord of the Rings* [\[LoR6\]](#)



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

- [Kel00] D. Kelly, *Digital Compositing In Depth*, Coriolis Group, 2000.
- [KM01] G. Kindem & R. B. Musburger, *Introduction to Media Production: From Analog to Digital*, 2nd Ed., Butterworth-Heinemann, 2001.
- [LoR1] *The Lord of the Rings DVD, The Appendices, Part 1: From Book to Vision.*
- [LoR2] *The Lord of the Rings DVD, The Appendices, Part 2: From Vision to Reality.*
- [LoR6] *The Lord of the Rings DVD, The Appendices, Part 6: The Passing of an Age.*