

IMAGE-BASED MODELING AND RENDERING

0. OVERVIEW (II)

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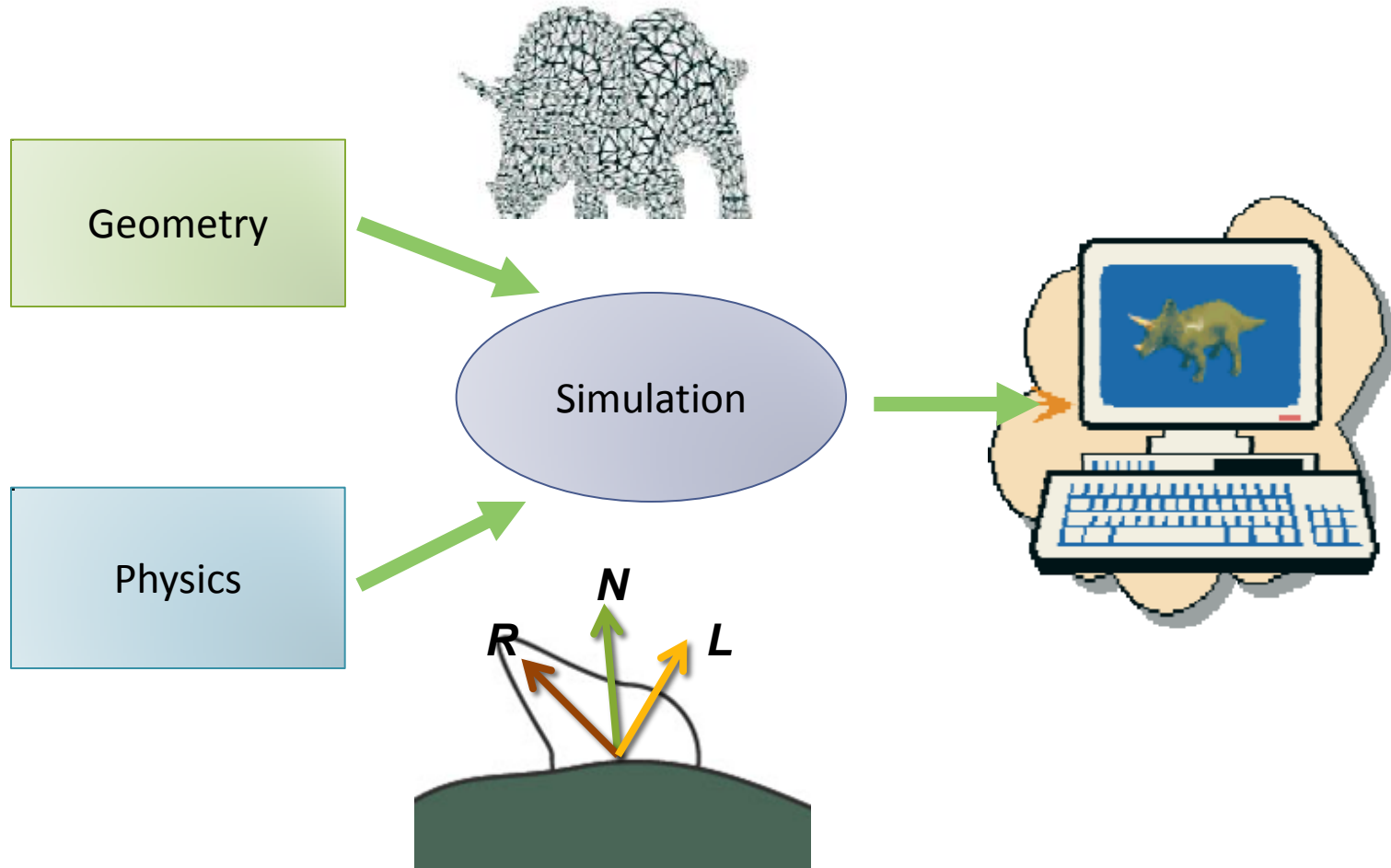
Outline

- What're Image-based approaches?
- When should I use IBMR techniques?

Ref: SIGGRAPH'99 Course Notes "IBMR"

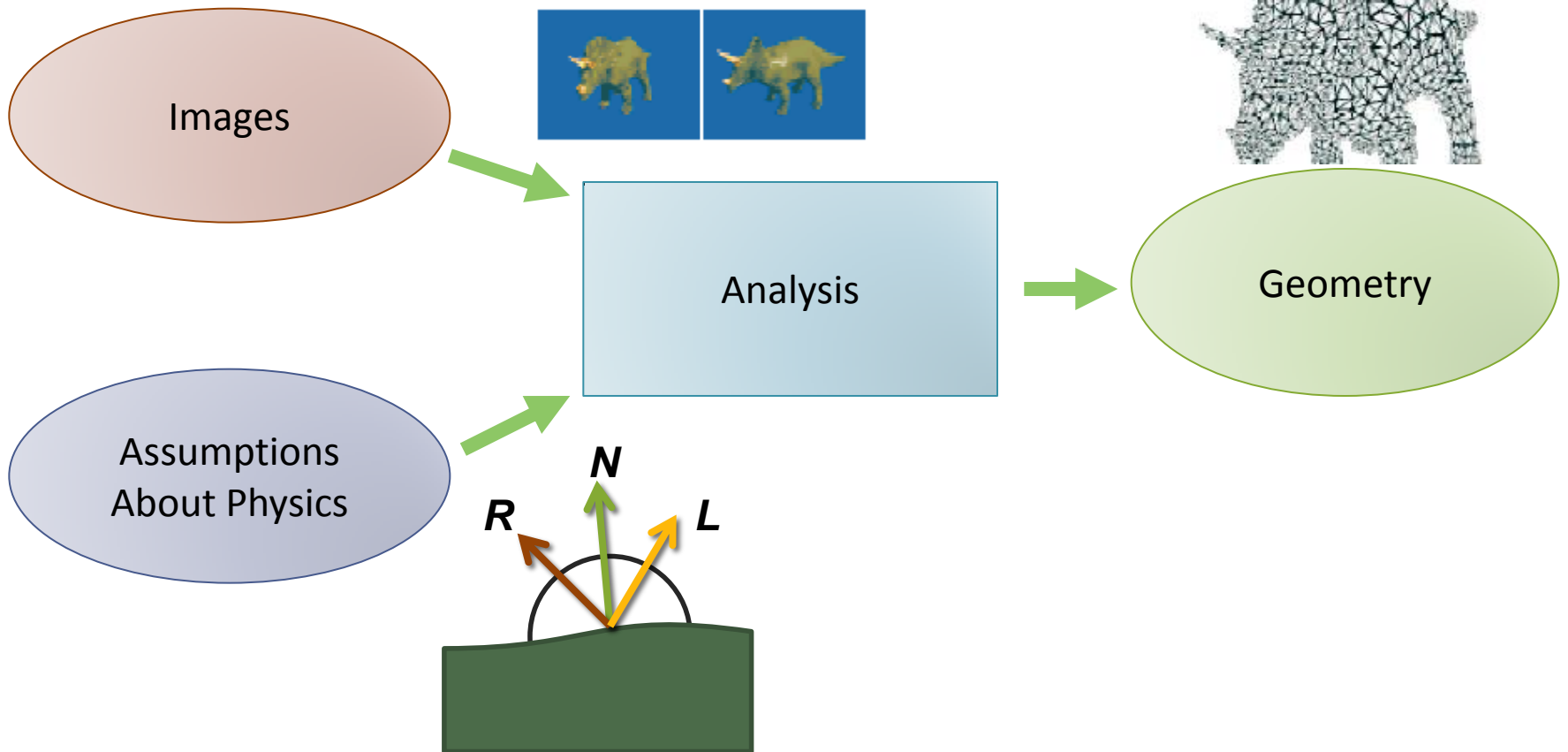
Conventional 3-D Graphics

Simulation



Computer Vision

Analysis



The Image-Based Approach

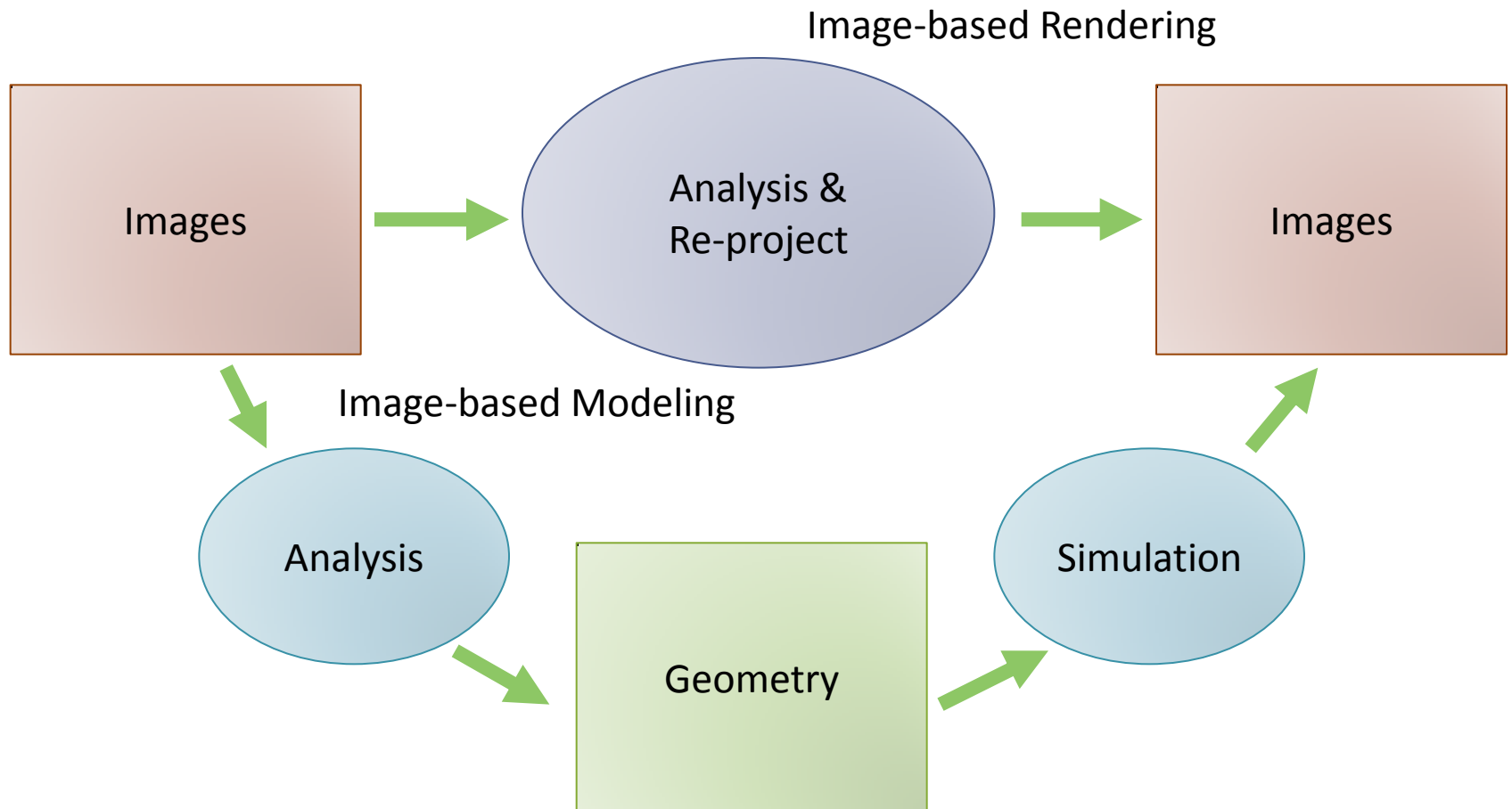


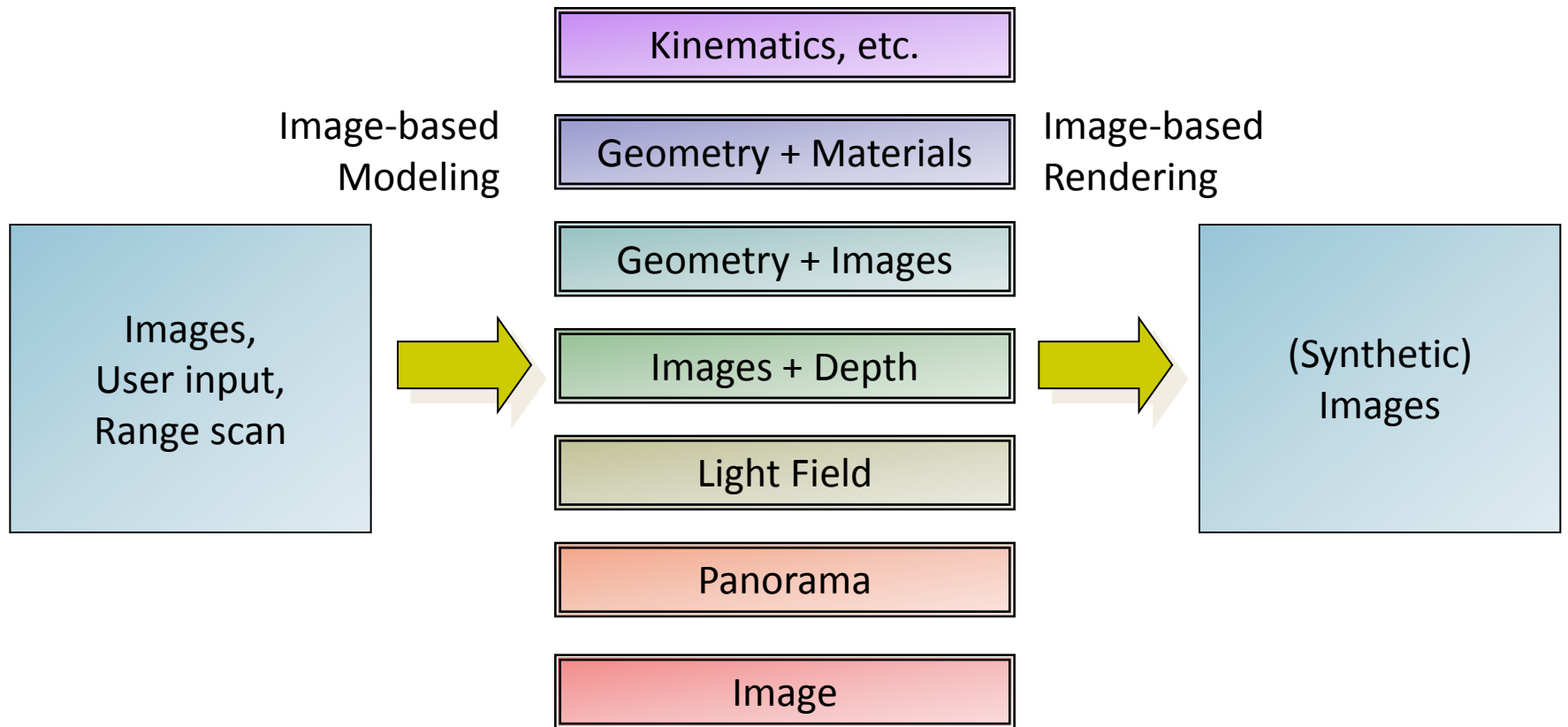
Image-Based Modeling

- Images (photographs, renderings) are used to determine
 - Scene Appearance
 - Scene Geometry
 - Lighting
 - Reflectance Characteristics
 - Kinematic Properties
- Modeling scenes photo-realistically is easier

Image-Based Rendering

- Appearance in available views is used to determine appearance in novel views
- Not necessary to perform full illumination computations
- Rendering could be faster and without modeling complex geometric details

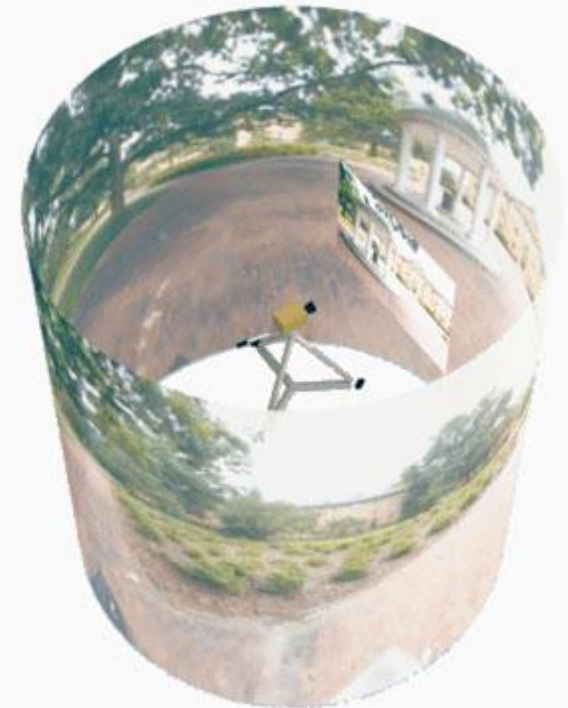
The Spectrum of IBMR



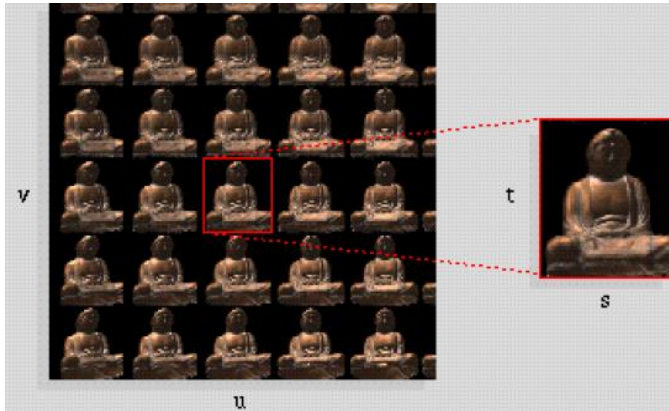
Panorama



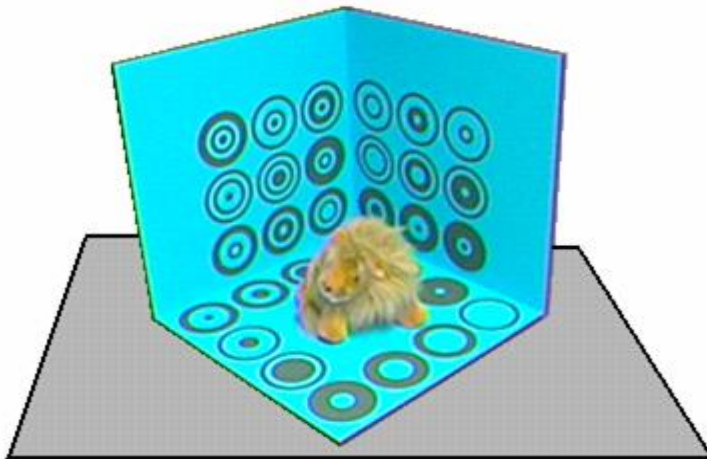
E.Chen, "QuickTime VR"



Light Fields



<http://lightfield.stanford.edu>



S.Gortler et al. "The Lumigraph"

Image + Depth



J.Shade et al. "Layered Depth Images"



Fig. from www.ifp.illinois.edu/~yuhuang/viewinterp.html

The Spectrum of IBMR (cont.)

| | Movement | Geometry | Lighting |
|----------------------------------|-----------------|-----------------|-----------------|
| Geometry + Materials | Continuous | Global | Dynamics |
| Geometry + Images | Continuous | Global | Fixed |
| Images + Depth | Continuous | Local | Fixed |
| Light Field | Continuous | None | Fixed |
| Panorama | Rotation | None | Fixed |
| Image (without view morphing) | None | None | Fixed |

Why do we develop IBMR tech.?

| | Pure geometry | IBR |
|------------|---------------|----------|
| Modeling | Difficult | Easy |
| Complexity | #triangles | #Pixels |
| Fidelity | Synthetic | Acquired |

Ref: Prof. Chang, NTNU, IBR lecture notes.