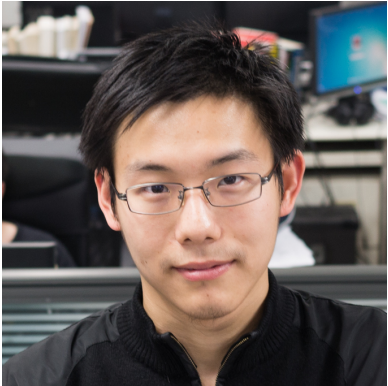


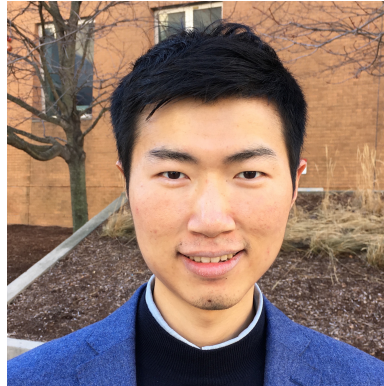
Physics 101: Learning Physical Object Properties from Unlabeled Videos



Jiajun Wu



Joseph Lim



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Bill Freeman

BMVC 2016





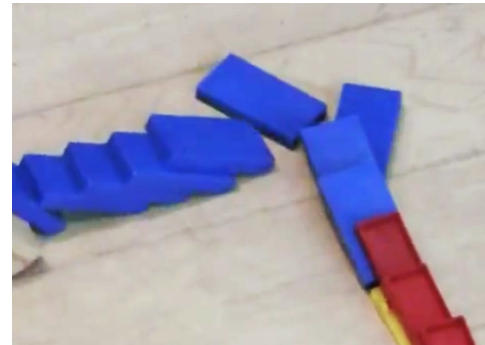
What can we learn from this video?



Understanding Dynamic 3D Scenes

- What can we learn from this video?

- 3D object shapes
- Physical events
- Physical object properties
 - Masses
 - Coefficients of frictions



collisions

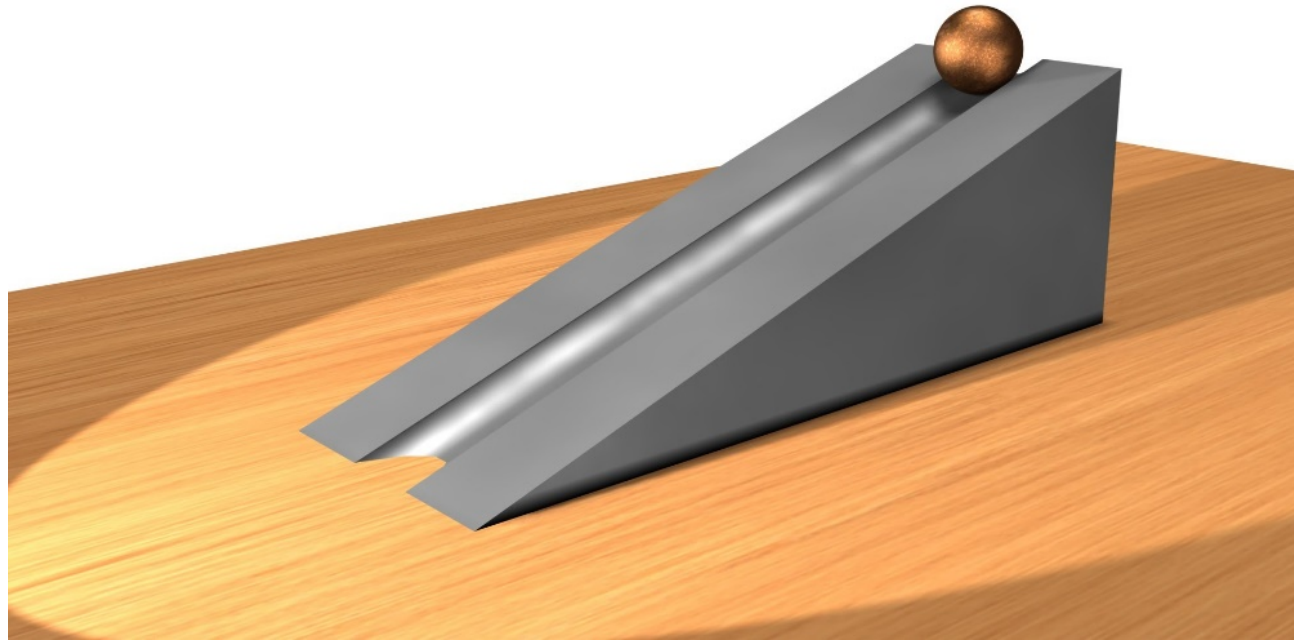


rolling

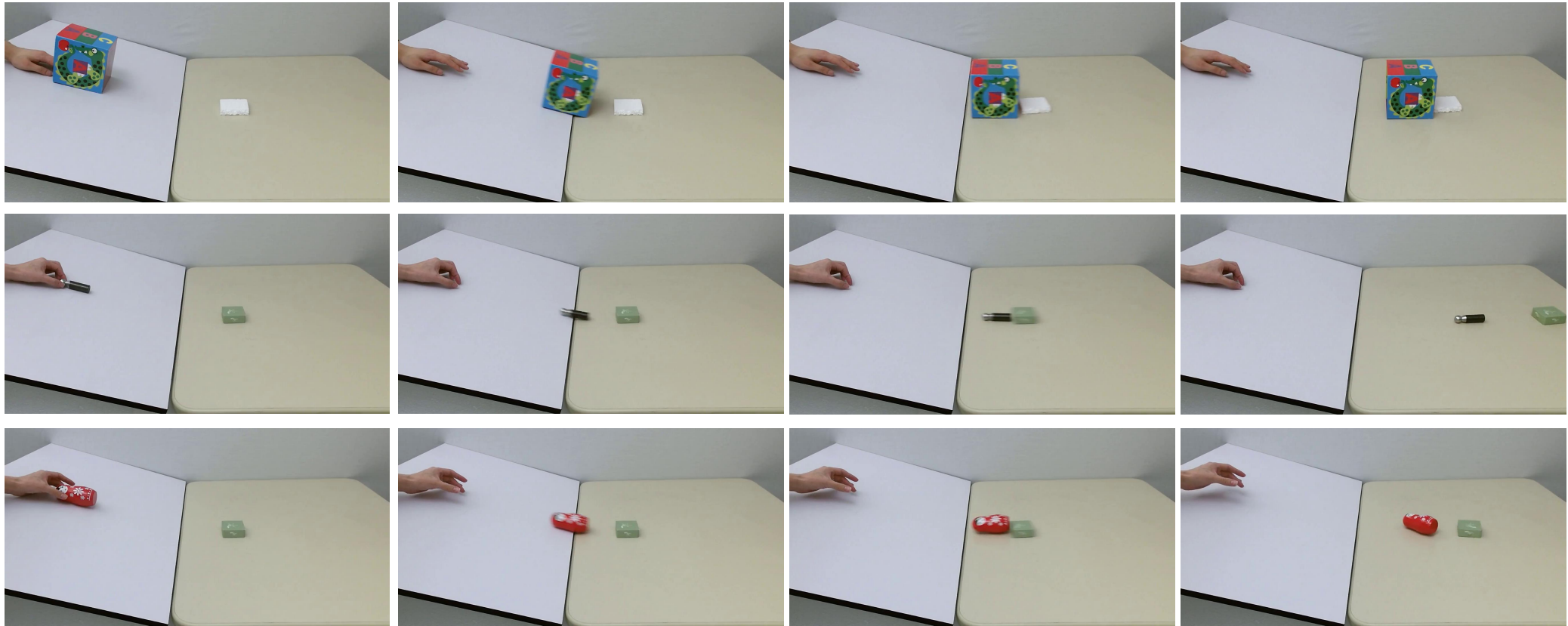
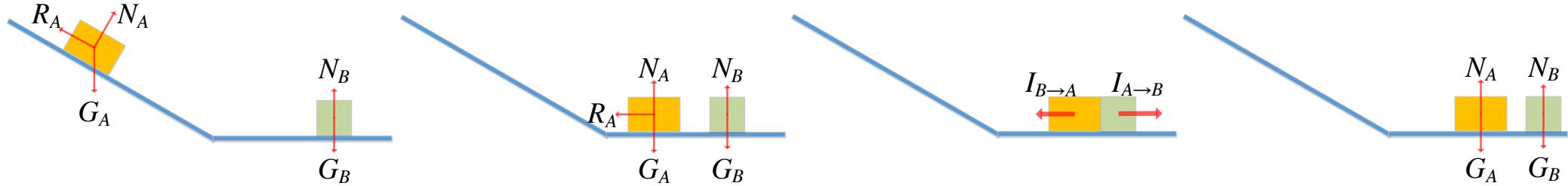
- Humans recover rich information from short videos.
- Generalization: Humans easily answer questions like
 - What will happen next?

A Simple Scenario in the Real World

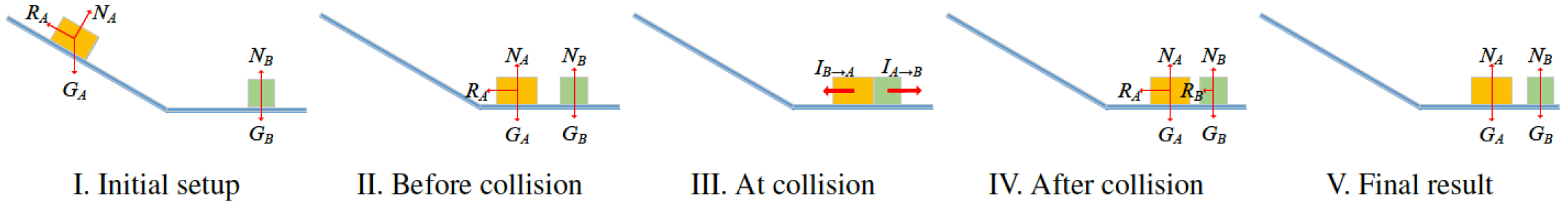
- Galileo's inclined surface experiment



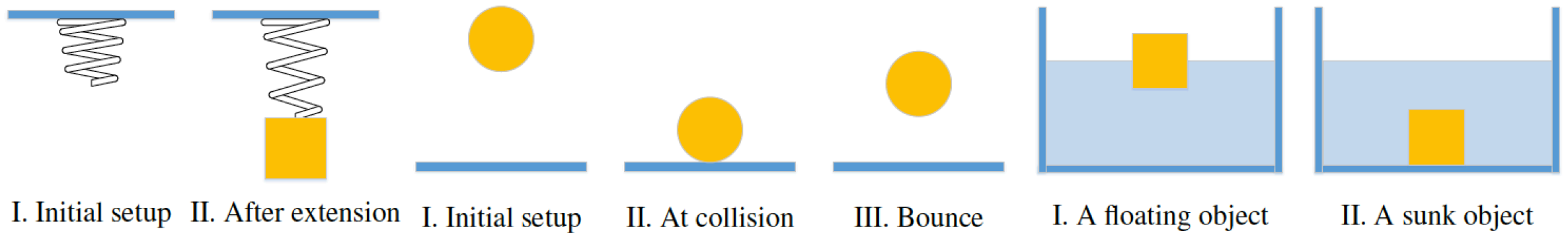
Rich Physics in Simple Scenarios



More Scenarios



Ramp



Spring

Bounce

Liquid

Physics 101: Objects



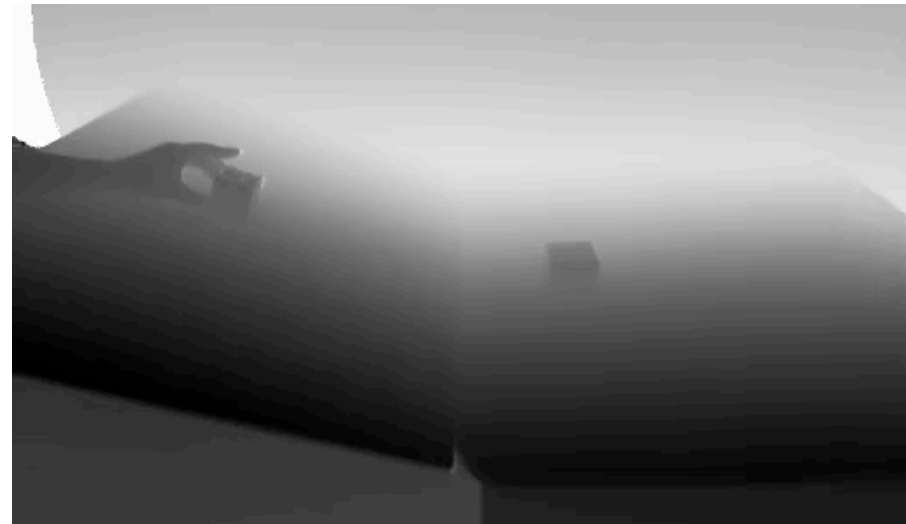
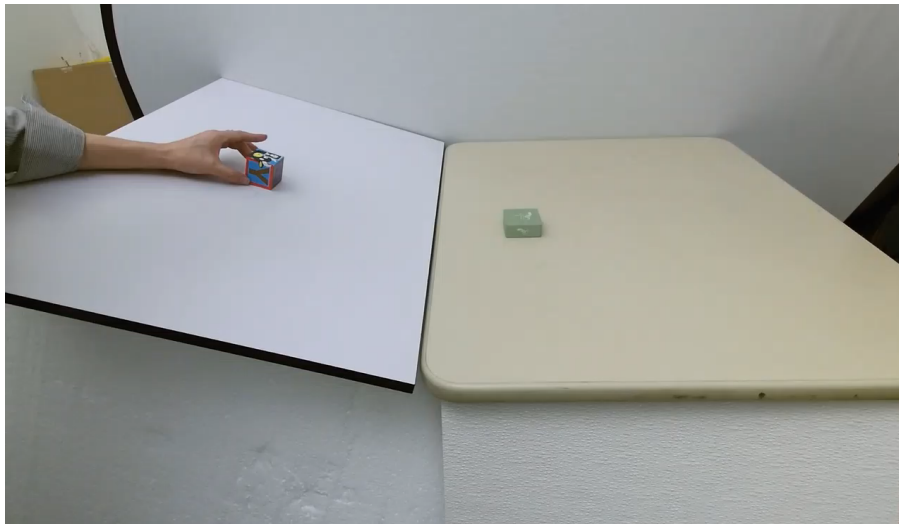
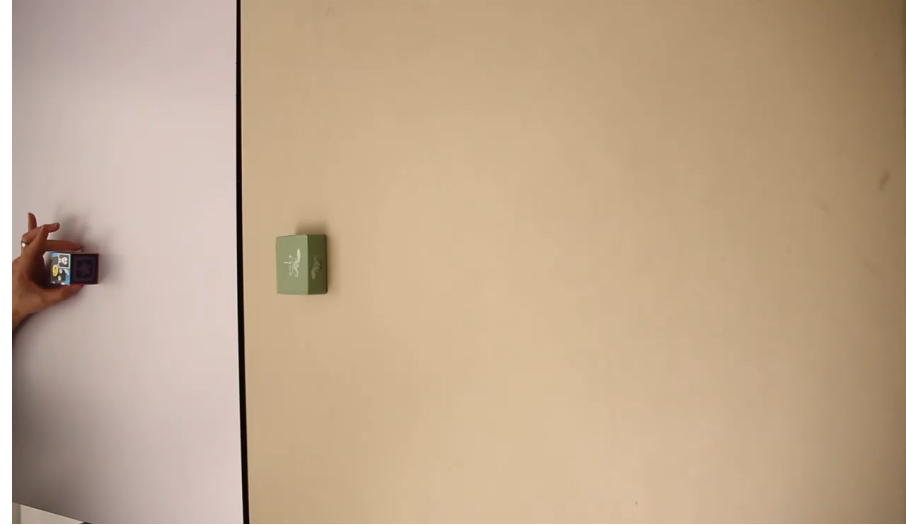
Pictures are at the same scale within each category but not across categories.

Physics 101: Dataset



Different scenarios from different viewpoints

Physics 101: Videos



Physics 101

- 101 objects
- 5 scenarios
- 3 viewpoints
- 4K events
- >10K videos

