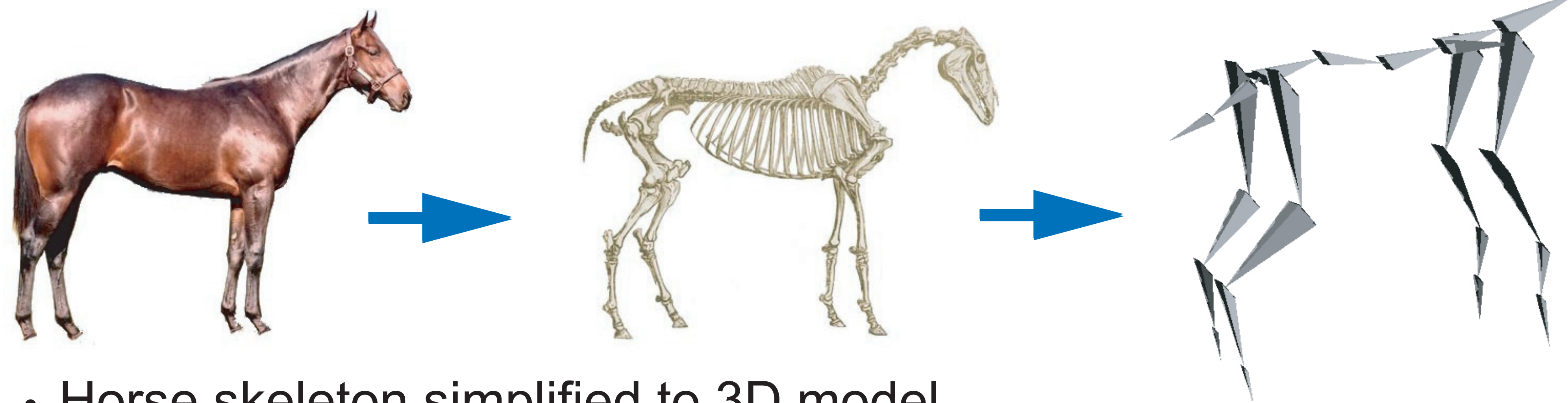


Constructing Model

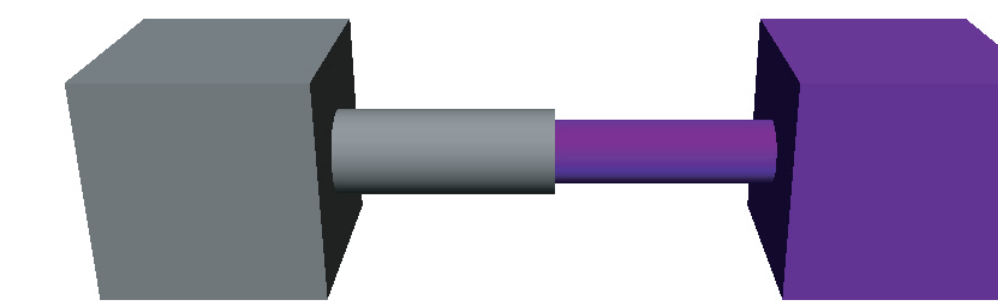
Physics-Based Horse Model



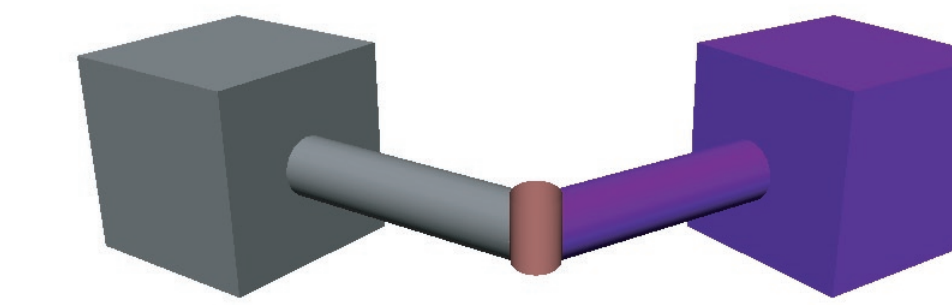
James Murphy, james.murphy@ucd.ie
School of Computer Science and Informatics
University College Dublin
Co-funded by **IRCSET** and **IBM**



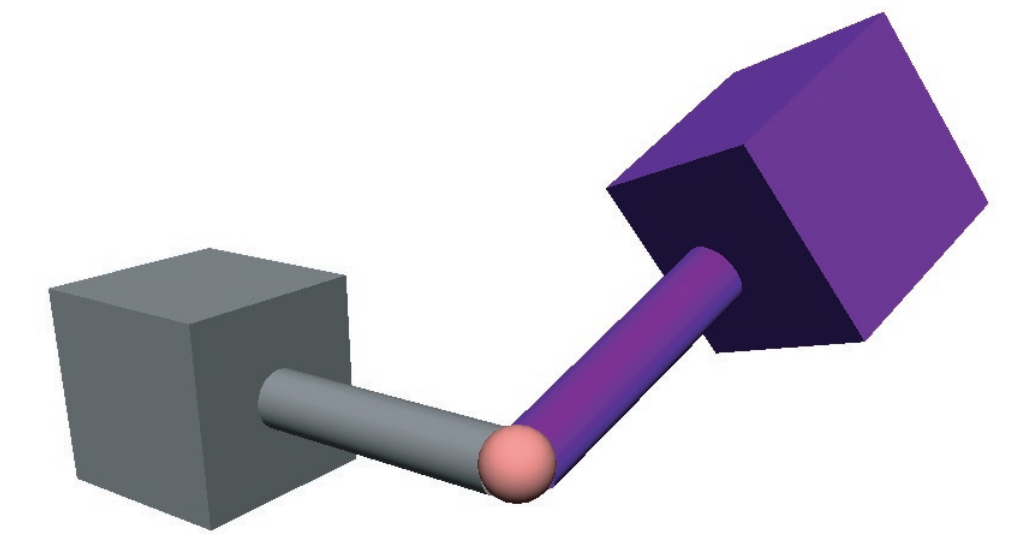
- Horse skeleton simplified to 3D model
- Rigid bodies
 - Dimensions, location, mass, centre of mass, moment of inertia



Prismatic (sliding)



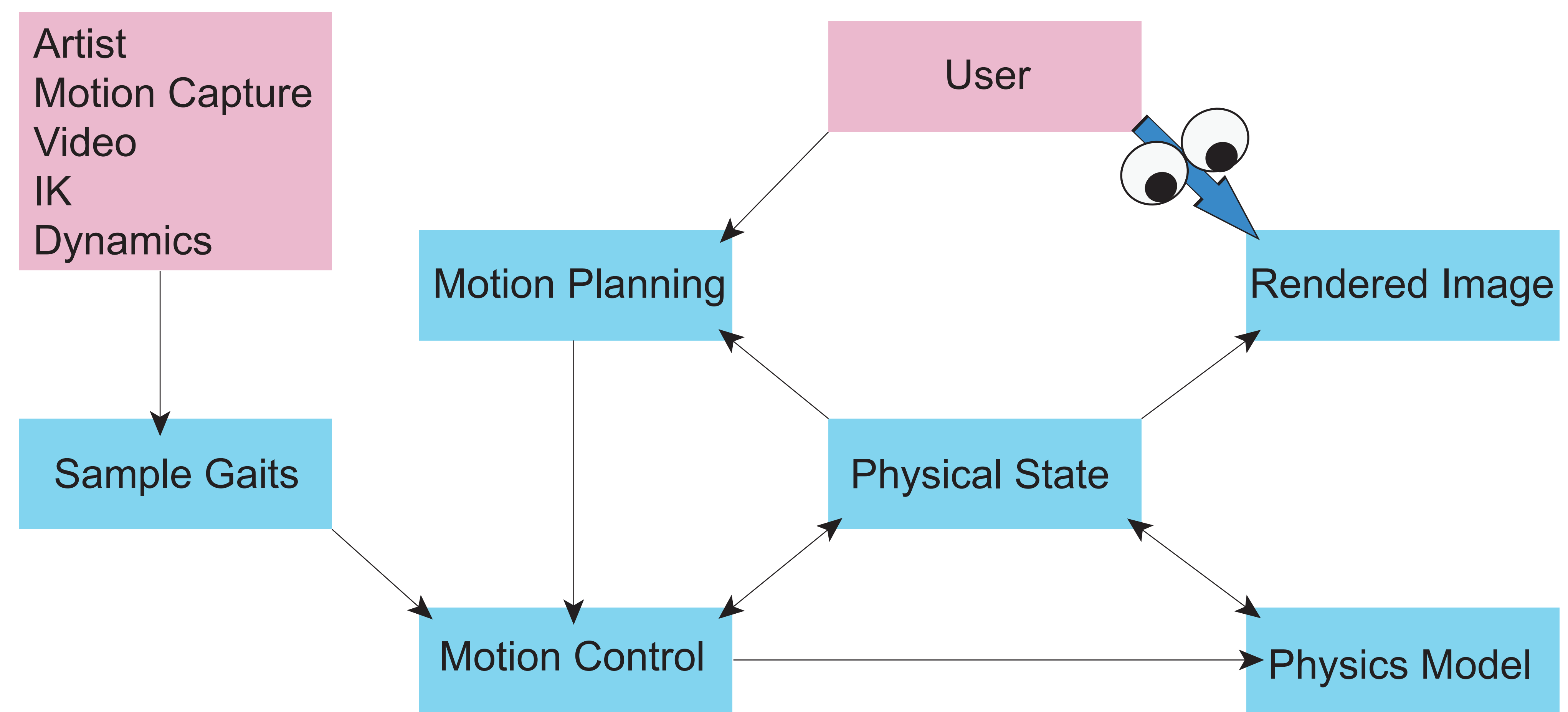
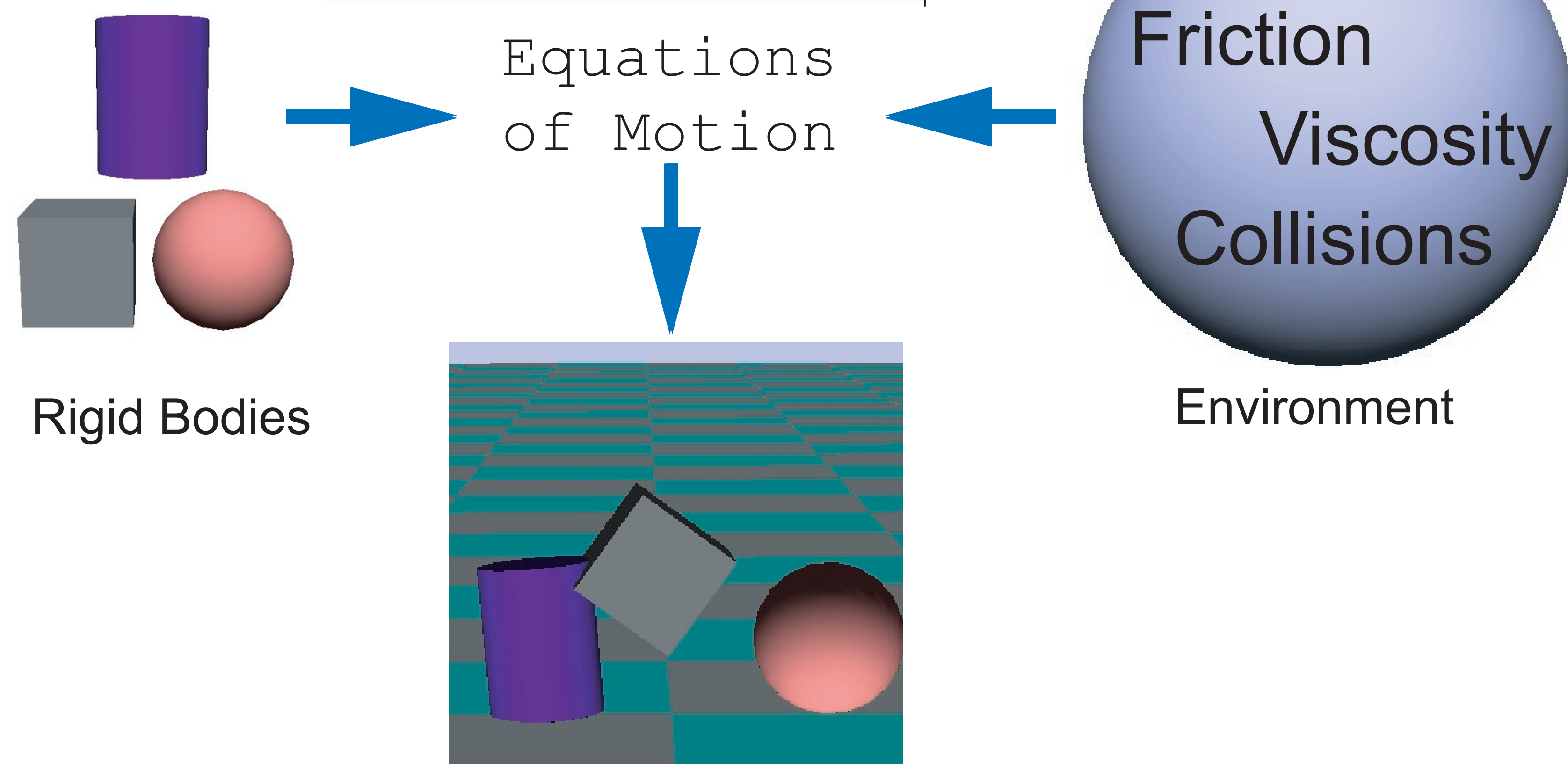
Hinge



Pivot (rotary)

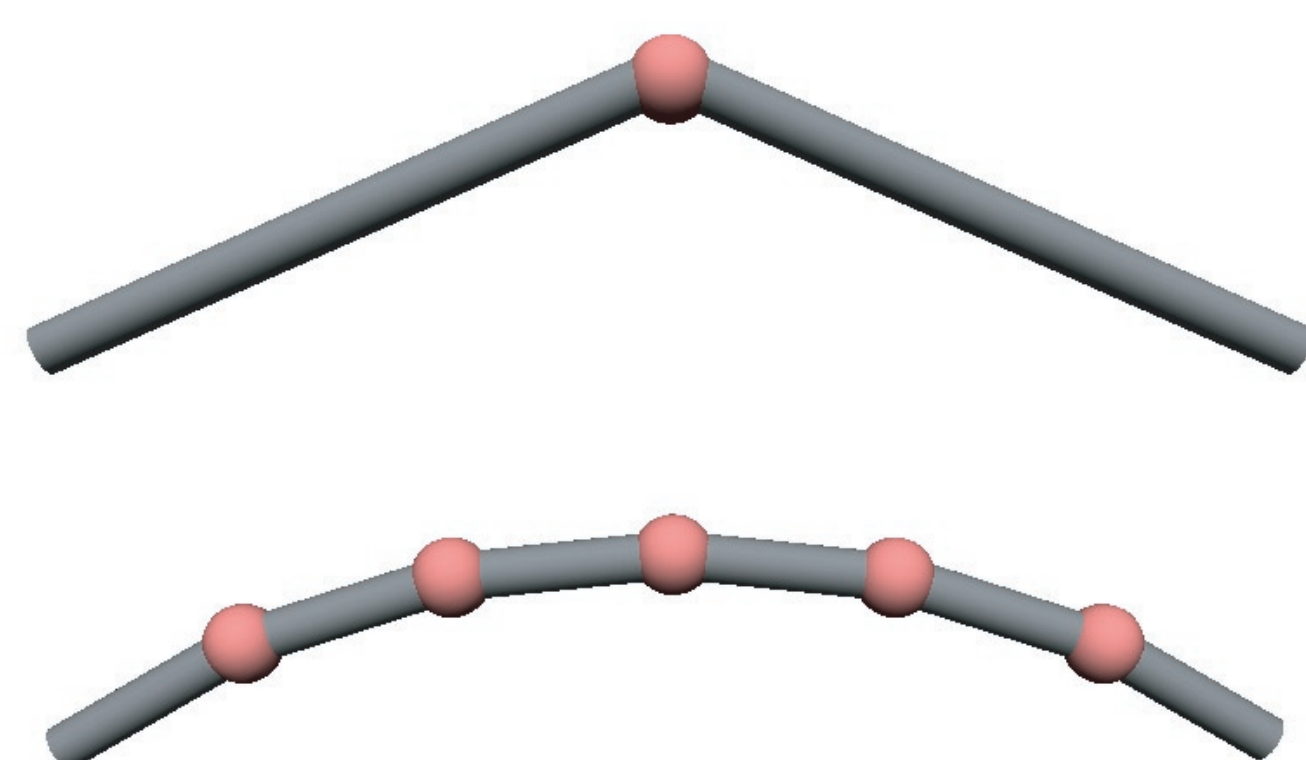
- Rigid bodies connected via joints
- Joint limits and constraints
 - Artist, photographs, video, motion capture

Animation Process



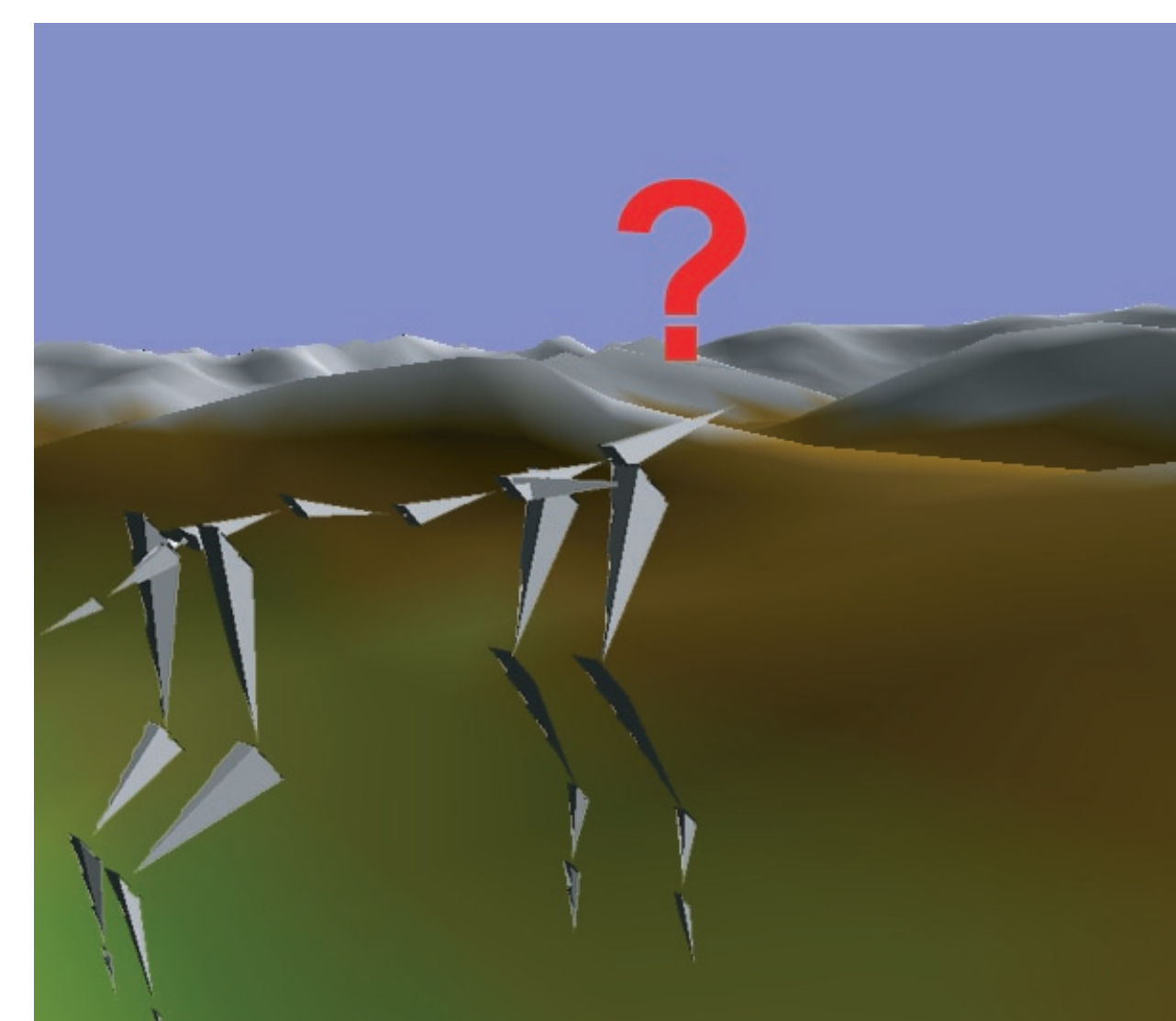
Future Challenges

Realism of Animation



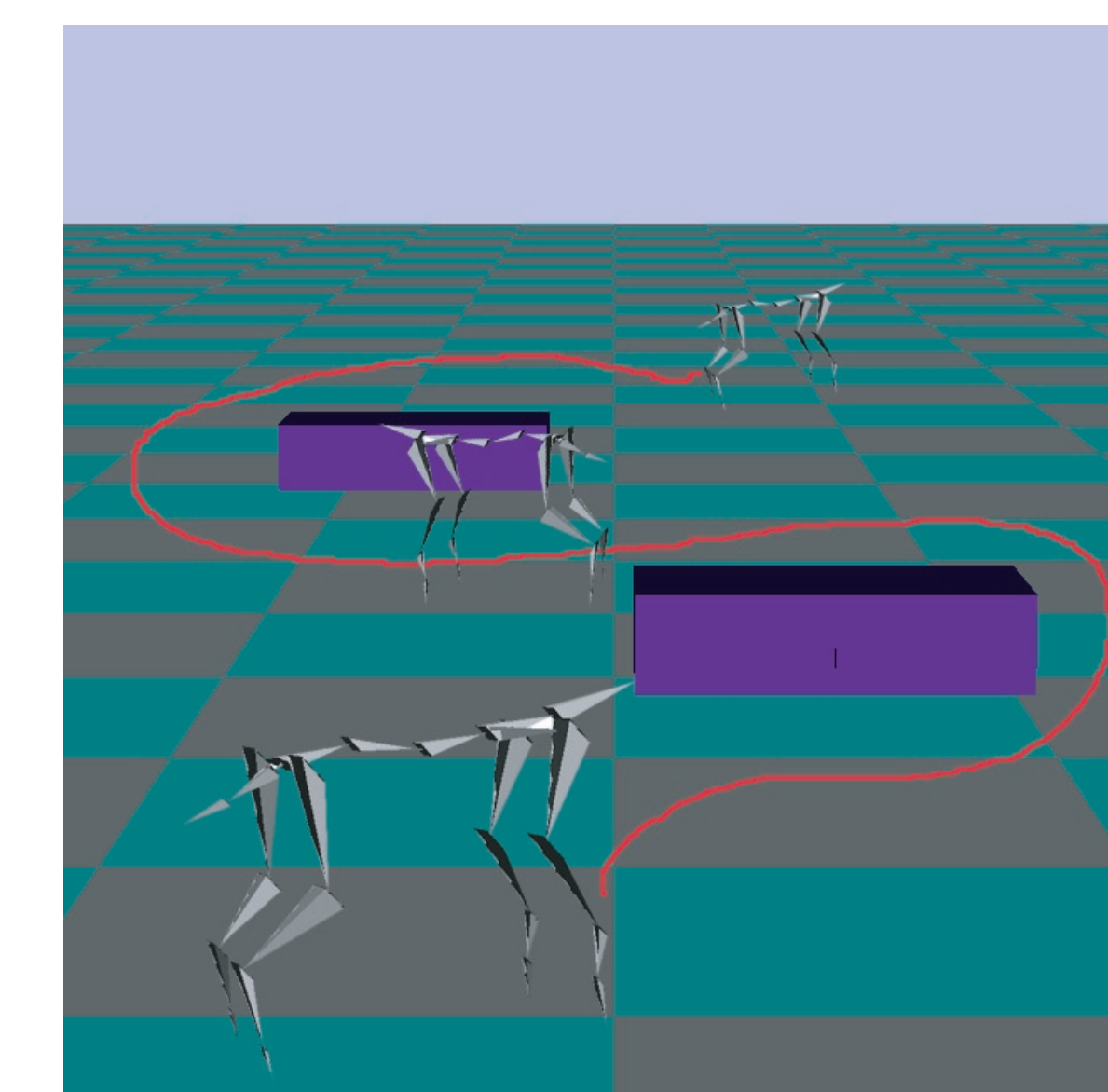
- Problems
 - Rigid animation
 - Lack of natural flexion
- Solutions?
 - More joints
 - Energy Minimisation Constraints

Variable Surface Conditions



- Problems
 - Uneven terrain
 - Frictional variance
 - Viscoelastic property variance
- Solutions?
 - Improve model
 - Artificial Intelligence
 - Footstep Planning

Control of Model



- Problems
 - Lack of interactive control
 - Lack of dynamic path planning
- Solutions?
 - Performance Animation
 - Spatial Keyframing
 - Footstep Planning
 - Artificial Intelligence
 - Sketch-based path planning