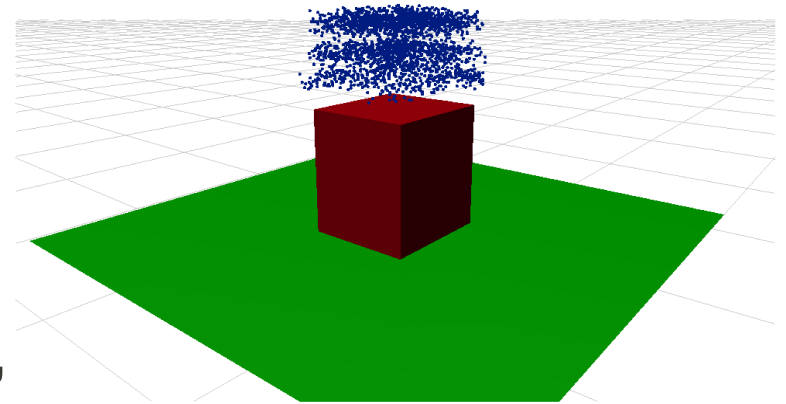# Understanding space

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# Spatial relations

- Topological:
  - "On", "In"
- Projective:
  - Absolute: "Above", "North of"
  - Intrinsic: "In front of", "To the right of"
  - Relative: "Right of", "Past"

# Frames of reference



"To the left of the bus"?
"To the right of the bus"?



"In front of the bus"?
"Behind the bus"?

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# Function and space

- Spatial concepts capture *functionally* important facts about space.

- Concepts are learned from success/failure at *tasks*.

- Language gives some hints about concepts.
    - E.g.: "On" ↔ Attachment, location control, support

# Physical simulation and learning

## E.g., location control:



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