Visualization
State Space Networks
State Space Diagrams

- Visualizations of all the states that the learning system can have during a problem
  - State = complete characterization of the situation

- Also referred to as student learning pathways or interaction networks
State Space Diagrams in Refraction

- http://play.centerforgamescience.org/refraction/site/

State 1 (Refraction)
State 2 (Refraction)
State 3 (Refraction)
Transitions between states
Can show single student trajectories
Successful student (Martin et al., 2012)
Unsuccessful student (Martin et al., 2012)

- Student goes back and forth endlessly between a small number of states...
Can be used to show all paths, and for more complex systems...

Start state

Thicker lines = more students

Success states
Uses

- Study specific student trajectories
- See which paths end up being productive
- See which paths are rare (despite being productive)
- Make recommendations (hints) to students based on their path (Stamper, Barnes, & Lehmann, 2008)
Next lecture

- Other visualizations of educational data