Ms PacMan Controller
CoboPac01

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Knowledge Representations

• Represent **maze as graph**
  – Nodes: Crossings or corners
  – Edges: Pathways between crossings & corners

• **Propagate pill activities** through graph
  – Model-based Reinforcement Learning approach

• **Project ghost presences** ahead with
  – estimated times of arrival and
  – probability of presence.
Knowledge Representation Example
Decision Making

- Generate local planning tree of particular depth
  - Propagate ghost interference probabilities, pill activities, and power pill options up and down the tree.
  - Derive ghost interferences respective estimated own arrival time.
  - Choose best path according to current strategy
    - Eating pills
    - Running away from ghosts
    - Hunting ghosts
Troubles and Challenges

- Technical challenges:
  - Parse maze effectively and accurately
    - Even when ghosts and Ms.PacMan are overlapping
    - Extra challenge: Derive ghost and Ms.PacMan velocities
  - Press keys in time – not too early and not too late...
    - Best approach seems to hold next direction key down and release only when next other direction key needs to be pressed.
  - Synchronize planning updates and state changes

- Strategy obstacles:
  - Not much time for strategy optimization so far.
  - Multi-objective problem with different situations.
  - We believe, there is lots of potential – maybe for next year 😊
Thank you for the attention!

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