# Windy gridworld

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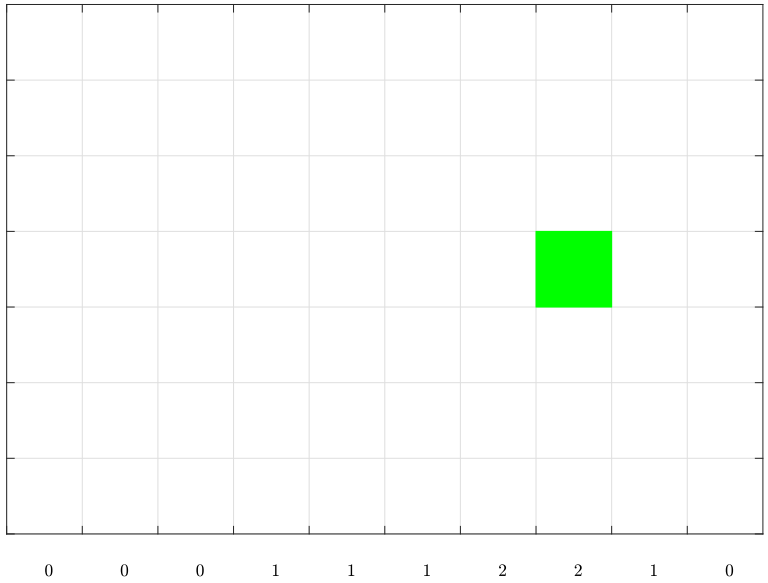
Machine and Reinforcement Learning in Control Applications

# Problem

Learn to move in an unknown map.

# Problem statement

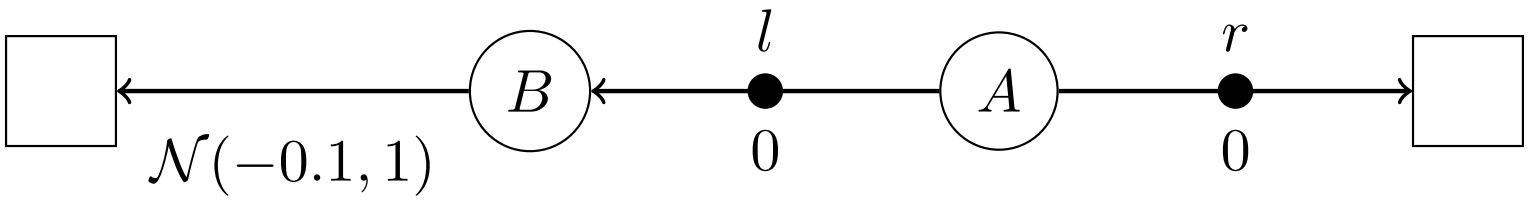
- Consider the gridworld on the right.
- There is a crosswind running upward through the grid
  - its amount is shown below each column;
  - next position is shifted.
- Reach green box.



# Modeling

- Undiscounted task
  - $\gamma = 1$.
- 60 states.
- 4 actions.

# Random walk




- $2$ states.
- $2$ actions in state $A$.
- By directly solving Bellman optimality equation
  - $v_*(B) = -0.1$;
  - $q_*(A, r) = 0$;
  - $q_*(A, l) = -0.1$.

# Optional Assignment

- Solve the windy gridworld.
- Assume king's move (include diagonal actions).
- Let the wind be stochastic (varying by $-1, 0, 1$ uniformly).