

# Project Overview

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COMP30024 Artificial Intelligence

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# This year's project

- Design, build and evaluate your own autonomous game playing agent
- Your game playing agent should be able to play against either a human player or another game playing agent (and maybe beat them)

# Game of Slider

- **Slider** a two-player strategic board game
- Two players (**H** and **V**) take turns to move one of their **pieces** on a square board, e.g., a board of dimension  $N = 5$  each player has  $N-1 = 4$  pieces:

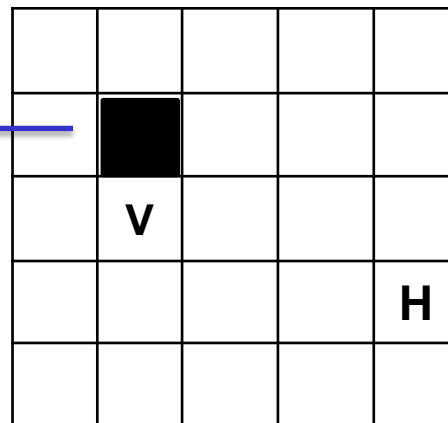
H				
H				
H				
H				
	V	V	V	V

Initial state of the game

# Objective of the Game

- The objective of each player is to move his/her pieces off the opposite edge of the board (i.e., right edge for 'H' and top edge for 'V')
- At each move, a player is allowed to move only one piece to an empty cell, i.e., not occupied by another piece or blocked
- Legal moves for H includes up, down, or right (but never to the left.), for V includes left, right or up (but never down). Pieces cannot move diagonally.
- A player wins if he/she is the first to move all his/her pieces off the appropriate edge of the board

Blocked cell,  
**V** cannot  
move to top  
(can move  
left or right)



If **H** is next to move  
and moves her piece  
to the right, then she  
wins.

# Challenges

- How to detect a **winning board state**?
- How do you know if you are **close** to a winning state?
- What is a good **next move**?
- How to balance **attack vs defence**?
- **Question**: How many moves can you look ahead on a board of dimension  $N = 6$ , assuming 1 Gbyte of memory?

# Expectations

- Implement robust, efficient and well-structured code
- Include clear comments to document your code
- Try a creative solution to the problem
- Systematically evaluate several alternative approaches, and interpret the results
- Any software libraries or existing implementations that are used in part or full (or for inspiration) must be acknowledged in your code

# Why games?

- Games are fun!
- Games are challenging for humans, and even more so for computer scientists
- Games test the limits of computers
- They provide an introduction to artificial intelligence