THE PELITA CONTEST

(A BRIEF INTRODUCTION)

ADVANCED SCIENTIFIC PROGRAMMING IN PYTHON
#ASPPAPAC2018

THE PELITA CONTEST

(A BRIEF INTRODUCTION)

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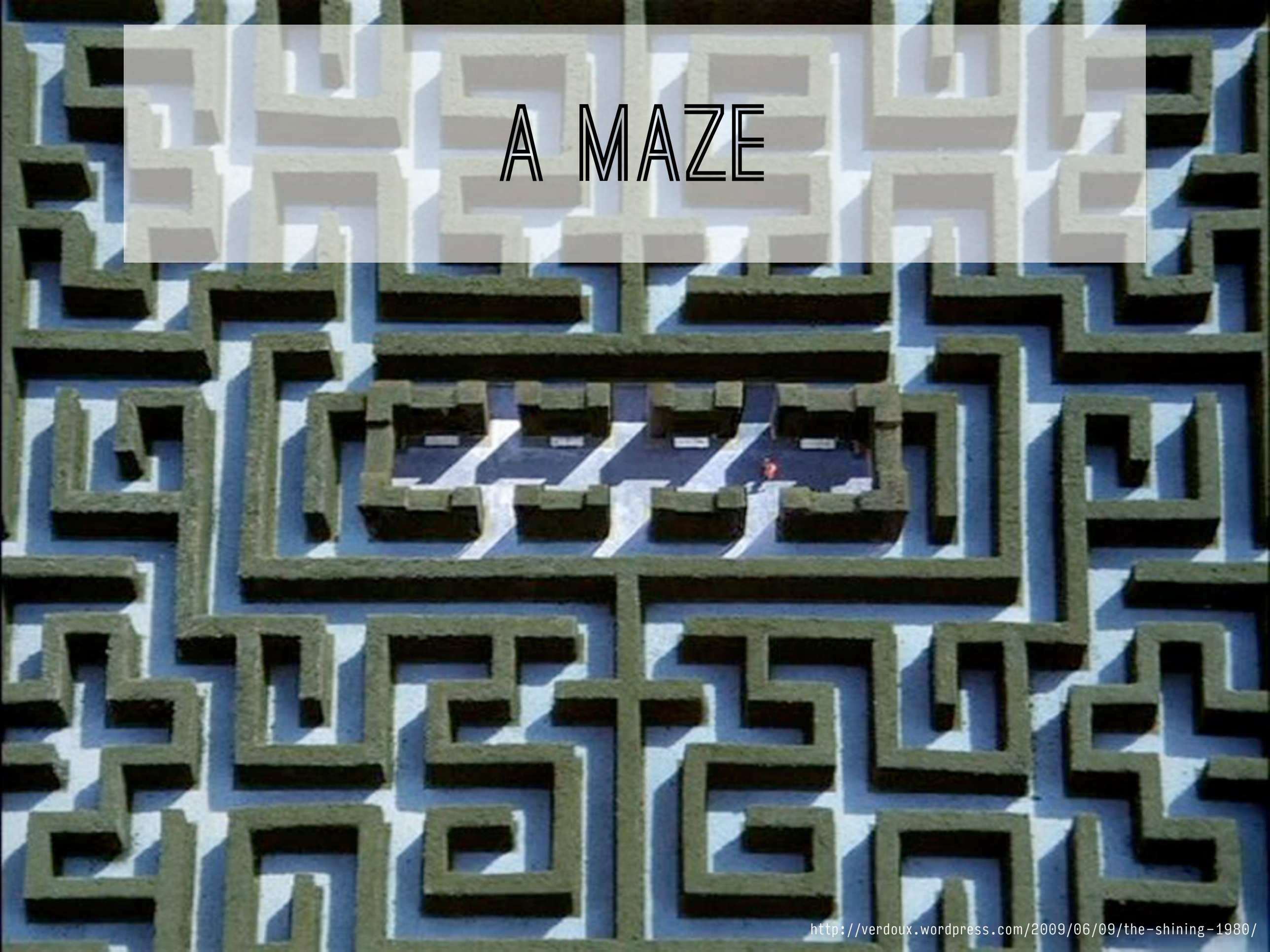
IN SHORT

A MAZE

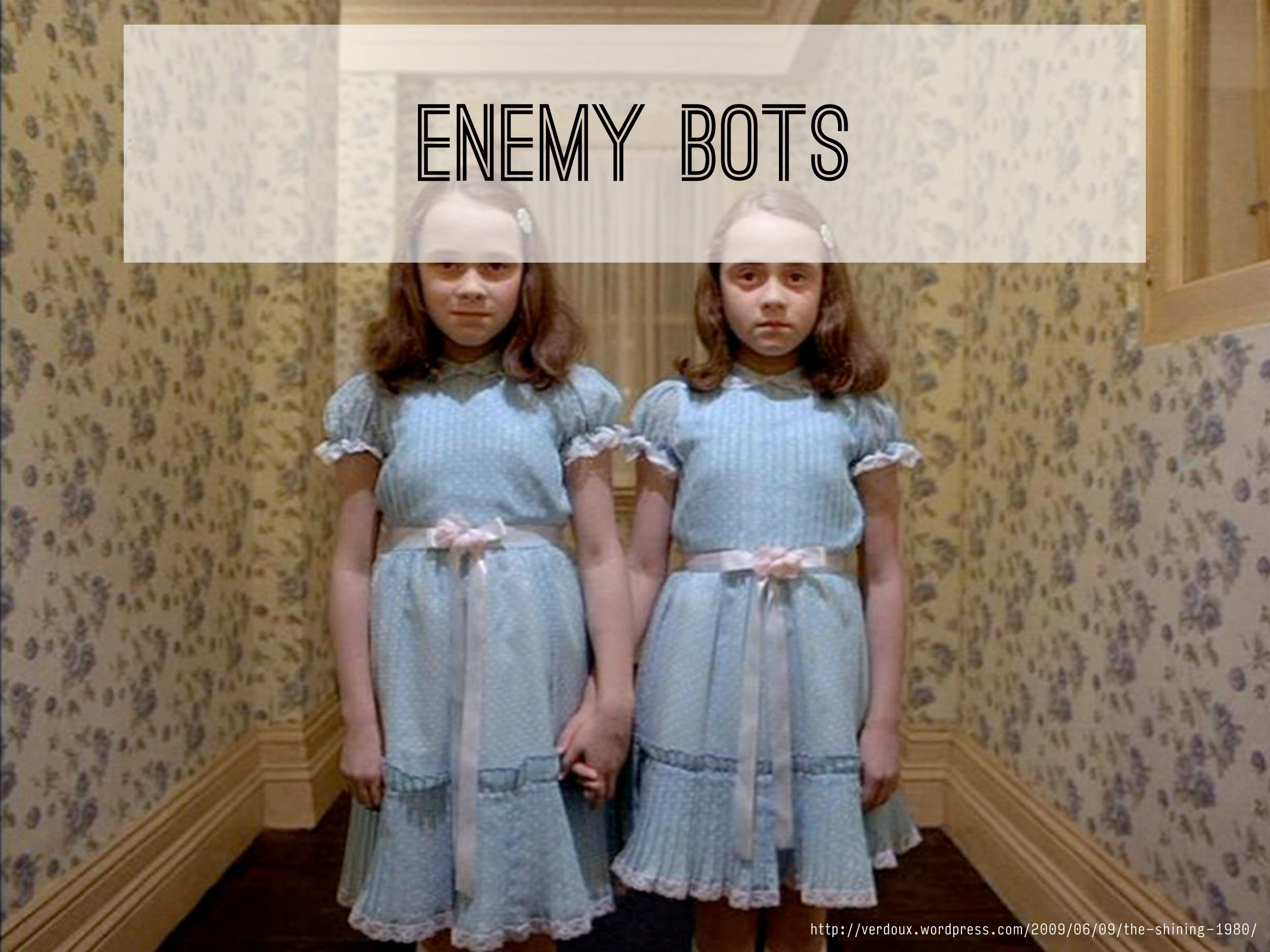


http://verdoux.wordpress.com/2009/06/09/the-shining-1980/

MOVING AROUND

http://verdoux.wordpress.com/2009/06/09/the-shining-1980/

ENEMY BOTS

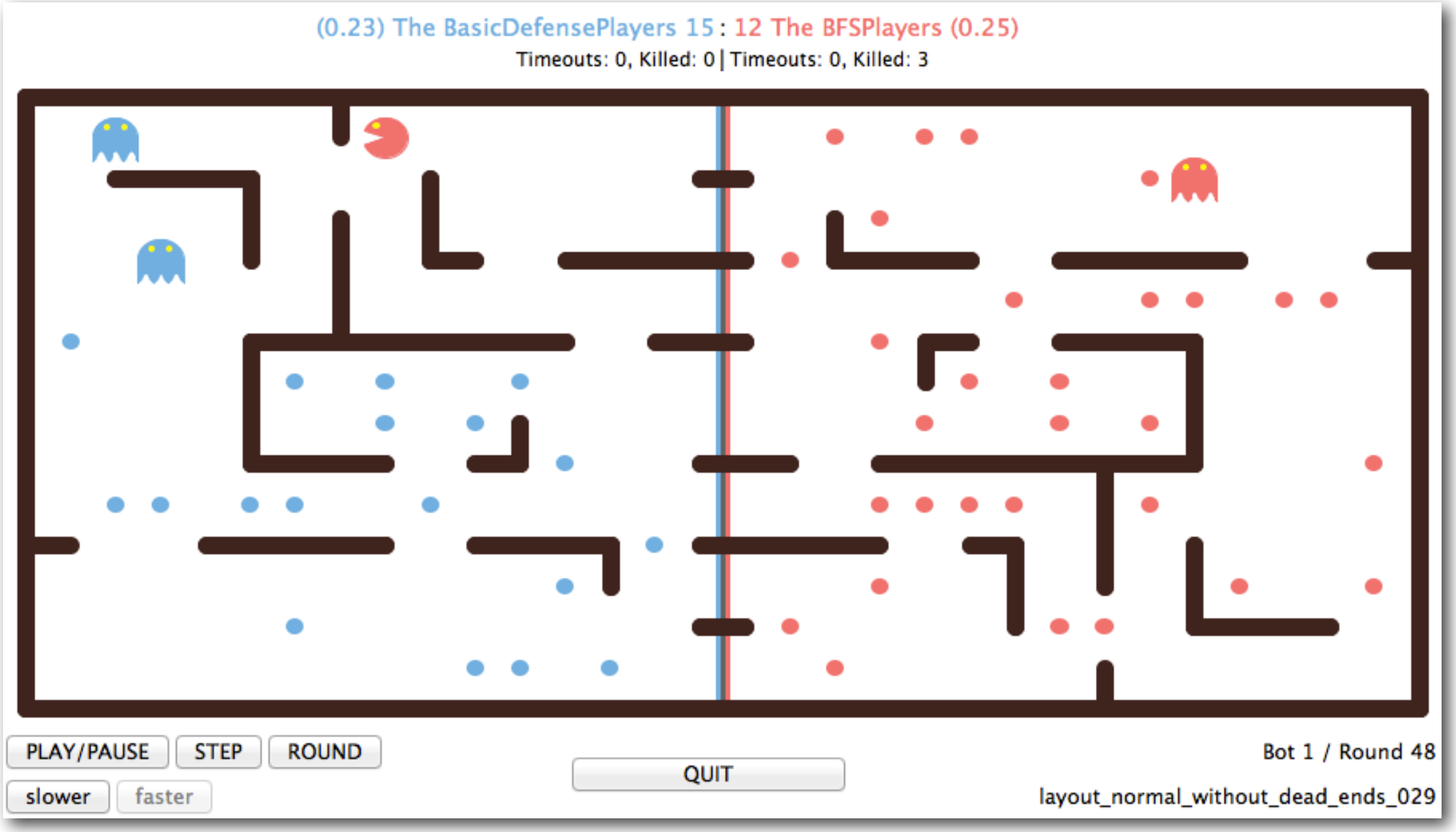


http://verdoux.wordpress.com/2009/06/09/the-shining-1980/

ATTACK

http://img.timeinc.net/time/photoessays/2008/top10_1950s/top10_1950s_them.jpg

PELITA


(0.23) The BasicDefensePlayers 15 : 12 The BFSPlayers (0.25)
Timeouts: 0, Killed: 0 | Timeouts: 0, Killed: 3
PLAY/PAUSE
STEP
ROUND
slower
faster
QUIT
Bot 1 / Round 48
layout_normal_without_dead_ends_029

BEFORE YOU ASK

- Pelita
- Actor-based Toolkit for Interactive Language Education in Python
- 'Pill-eater'
- Created 2011–2012 especially for the summer school
- (Idea from John DeNero and Dan Klein, UC Berkeley[1])

[1] http://www.denero.org/content/pubs/eaai10_denero_pacman.pdf

AUTHORS

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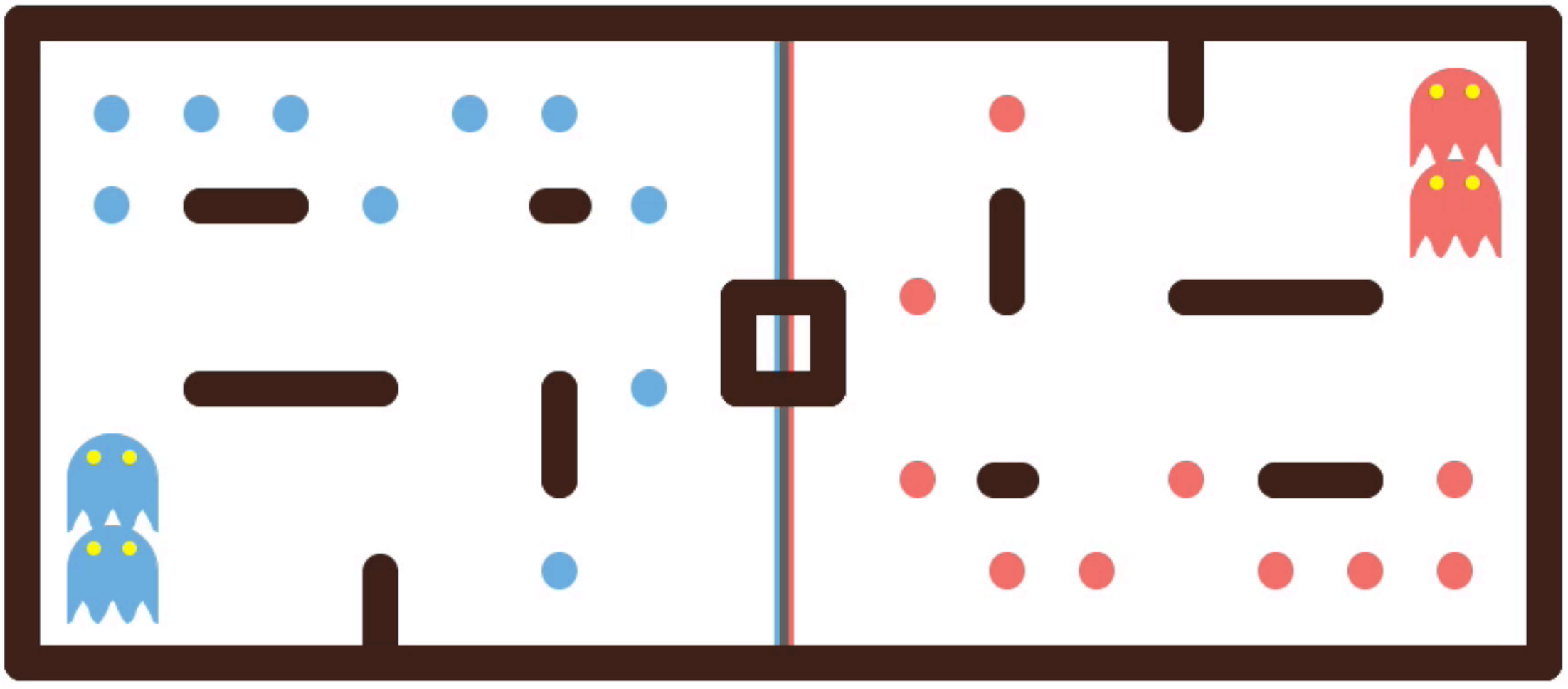
OVERVIEW

(0.00) The FoodEatingPlayers 0 : 0 The RandomExplorerPlayers (0.00)

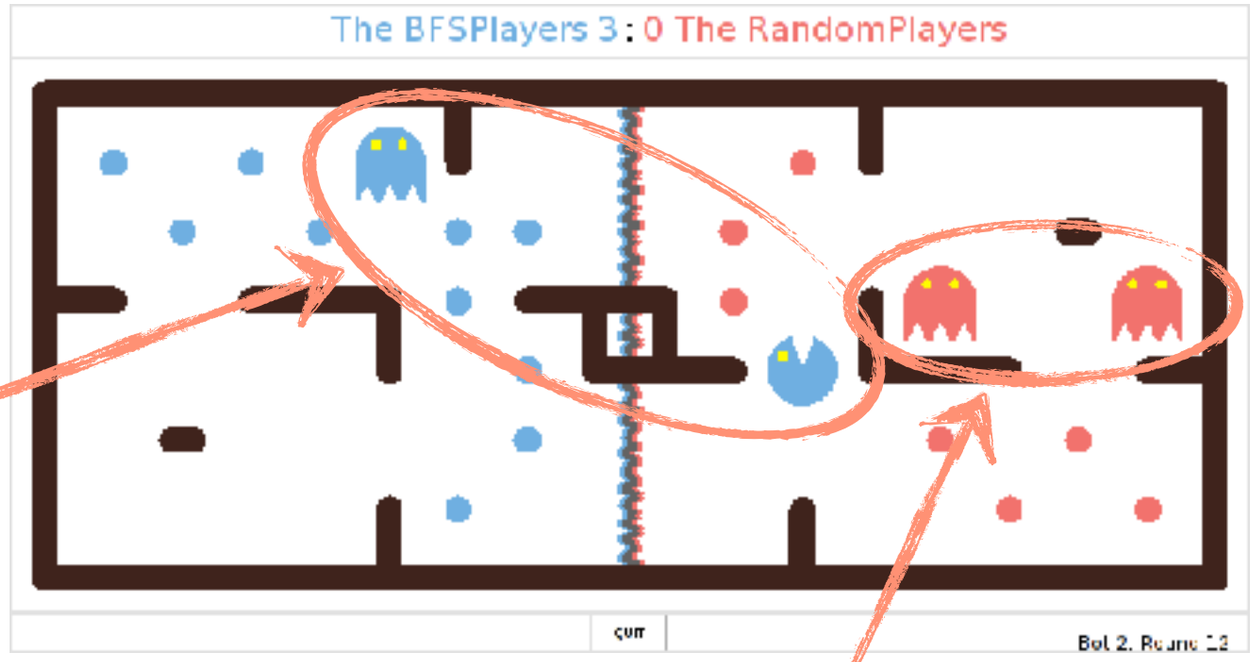


PLAY/PAUSE | STEP | ROUND

slower | faster | show grid

QUIT

OVERVIEW

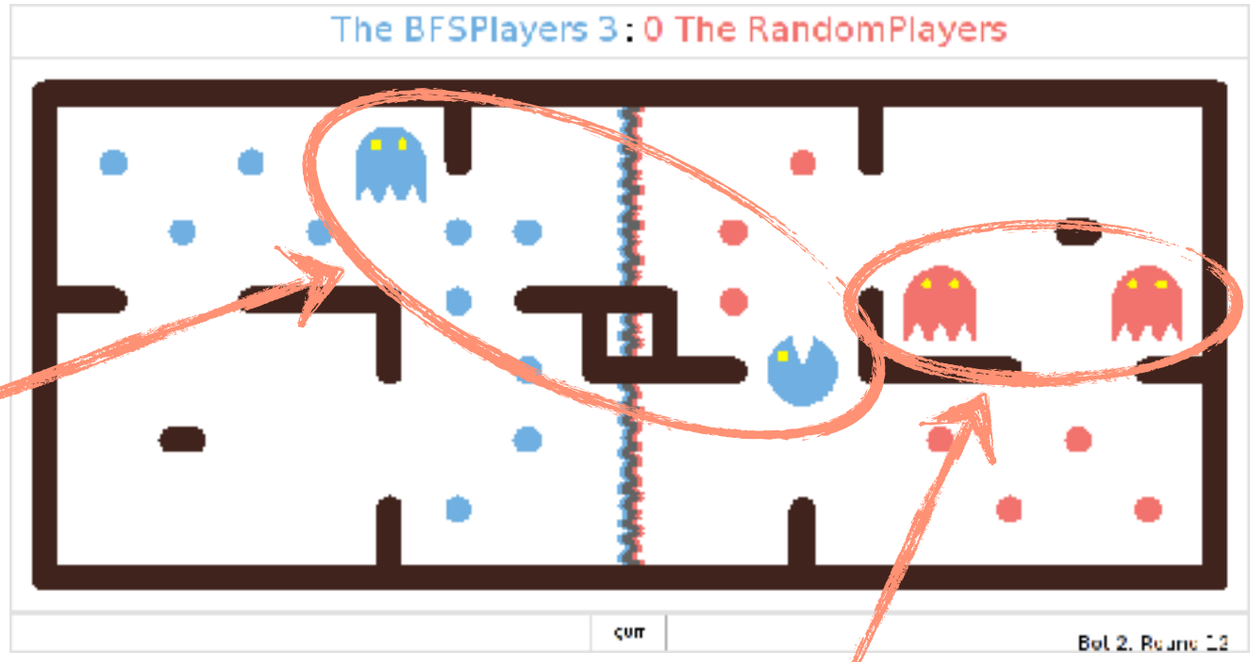


Bots for team 0

Bots for team 1

- Each Team owns two Bots

OVERVIEW



Bots for team 0

Bots for team 1

- Each Team owns two Bots
- Each Bot is controlled by a Player

OVERVIEW

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- Harvester or Destroyer Bots

OVERVIEW

- Each Team owns two Bots
- Each Bot is controlled by a Player
- Harvester or Destroyer Bots
- Bots are Destroyers in homezone
- Harvesters in enemy’s homezone
- Game ends when all food pellets are eaten

CONTROLLING THE BOTS

MY FIRST PLAYERS

```
from pelita.datamodel import east
from pelita.player import AbstractPlayer

class UnidirectionalPlayer(AbstractPlayer):
    def get_move(self):
        return east

class DrunkPlayer(AbstractPlayer):
    def get_move(self):
        directions = self.legal_moves
        random_dir = self.rnd.choice(directions)
        return random_dir
```

- Careful: Invalid return values of get_move result in a random move.
  (You could wrap get_move in a decorator, if you are unsure.)

API EXAMPLES

- In your get_move method, information about the current universe and food situation is available. See the documentation for more details.

- `self.current_pos`
  Where am I?

- `self.me`
  Which bot am I controlling?

- `self.enemy_bots`
  Who and where are the other bots?

- `self.enemy_food`
  Which are the positions of the food pellets?

- `self.current_uni`
  Retrieve the universe you live in.

- `self.current_uni.maze`
  How does my world look like?

- `self.legal_moves`
  Where can I go?

- `self.me.is_destroyer`
  Am I dangerous?

BUILDING A TEAM

- A team consists of two players (and a name)
- Create it using the `SimpleTeam` class
  - `SimpleTeam("Magnificent Team", GoodPlayer(), RemarkablePlayer())`
- Export your team using the `team` function
  - ```
    def team():
        return SimpleTeam(...)
    ```
    ```

THE RULES

http://filmscoreclicktrack.com/2013/01/the-ten-commandments-of-film-music/

THE RULES

- Eating: When a Bot eats a food pellet, the food is permanently removed and one point is scored for that Bot's team.
- Timeout: Each Player only has 3 seconds to return a valid move. If it doesn't, a random move is executed. (All later return values are discarded.)
  5 timeouts and you're out!
- Eating another Bot: When a Bot is eaten by an opposing destroyer, it returns to its starting position (as a harvester). 5 points are awarded for eating an opponent.
- Winning: A game ends when either one team eats all of the opponents' food pellets, or the team with more points after 300 rounds.
- Observations: Bots can only observe an opponent's exact position, if they or their teammate are within 5 squares of the opponent bot. If they are further away, the opponent's positions are noised.

DEMO TIME

- Now, let’s build an example player

DEMO BOTS

- In pelita/player directory
- There are hidden bots on our servers
  - We tell you how to use them when it’s time

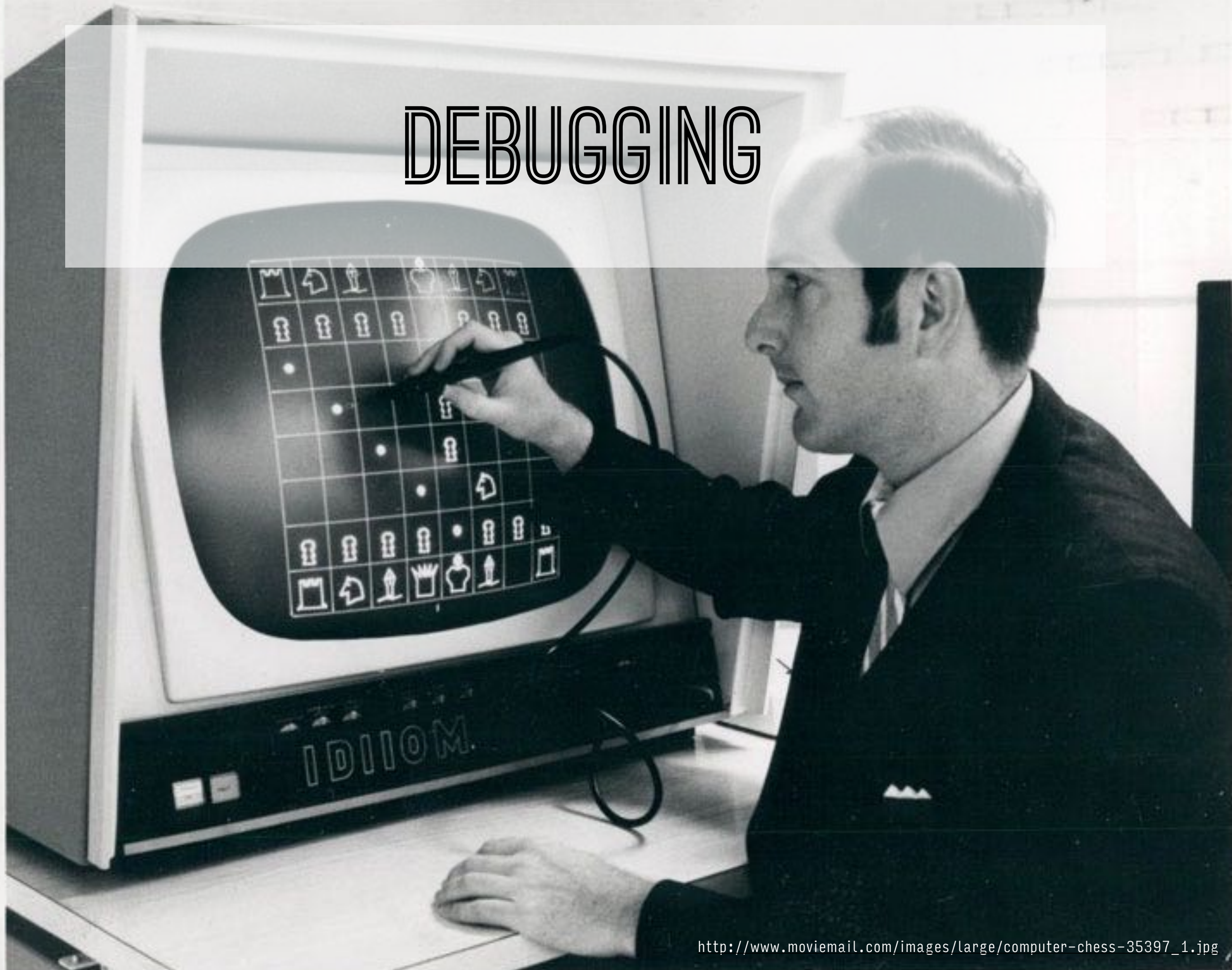
TESTING

http://verdoux.wordpress.com/2009/06/09/the-shining-1980/

TESTING

- Two ways to test your Players
- first: Simply run the game and test by watching
  - $ pelita MyTeam EnemyTeam
- second: Write proper tests and test by testing
  - Example in the template

DEBUGGING



http://www.moviemail.com/images/large/computer-chess-35397_1.jpg

DEBUGGING

- Use a pre-defined DebuggablePlayer to explore the API
- class DebuggablePlayer(AbstractPlayer):

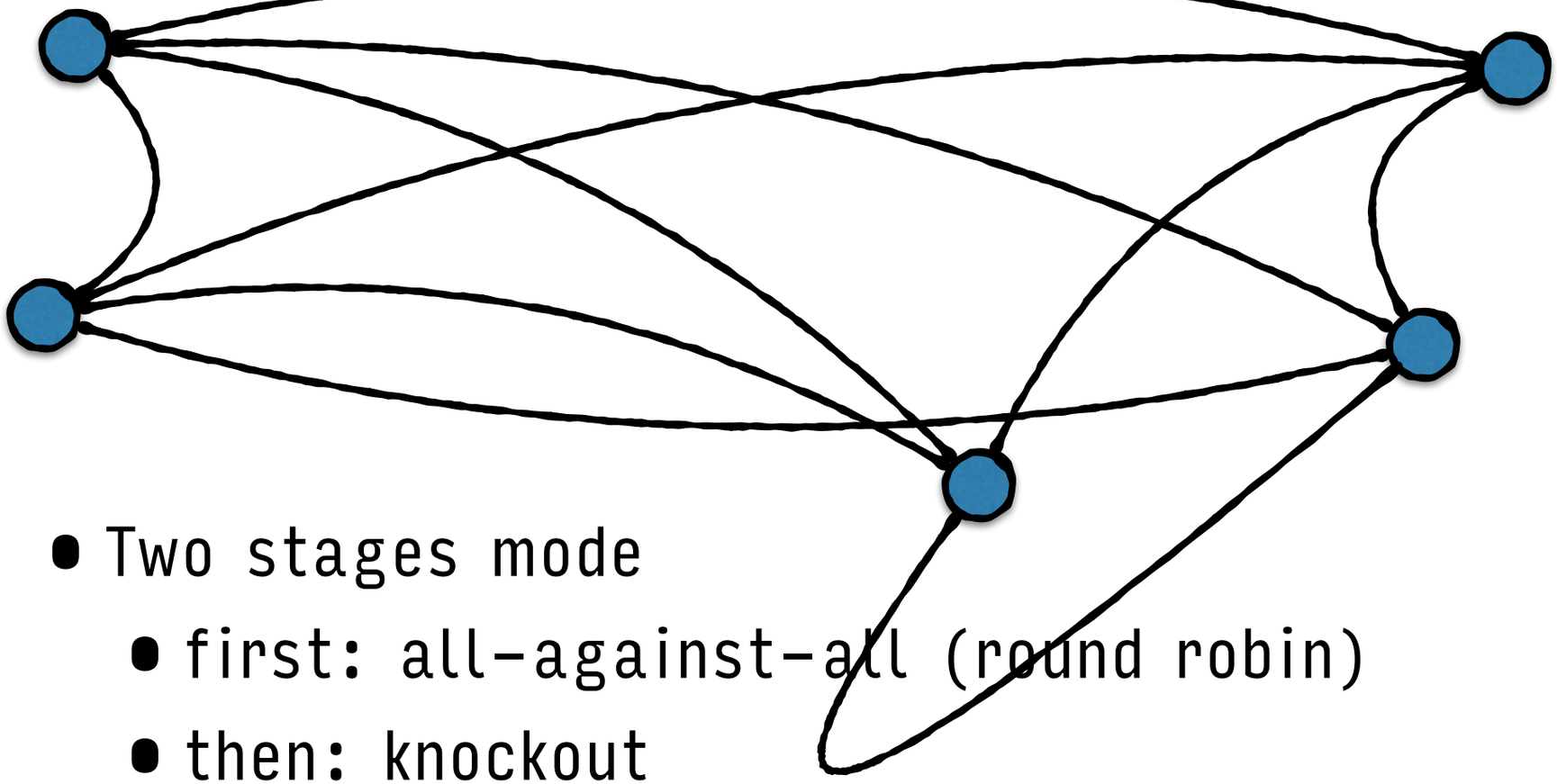
```
    def get_move(self):
        direction = datamodel.stop
        pdb.set_trace()
        return direction
```

- pelita --no-timeout DebuggablePlayer
- (Pdb) p self.me

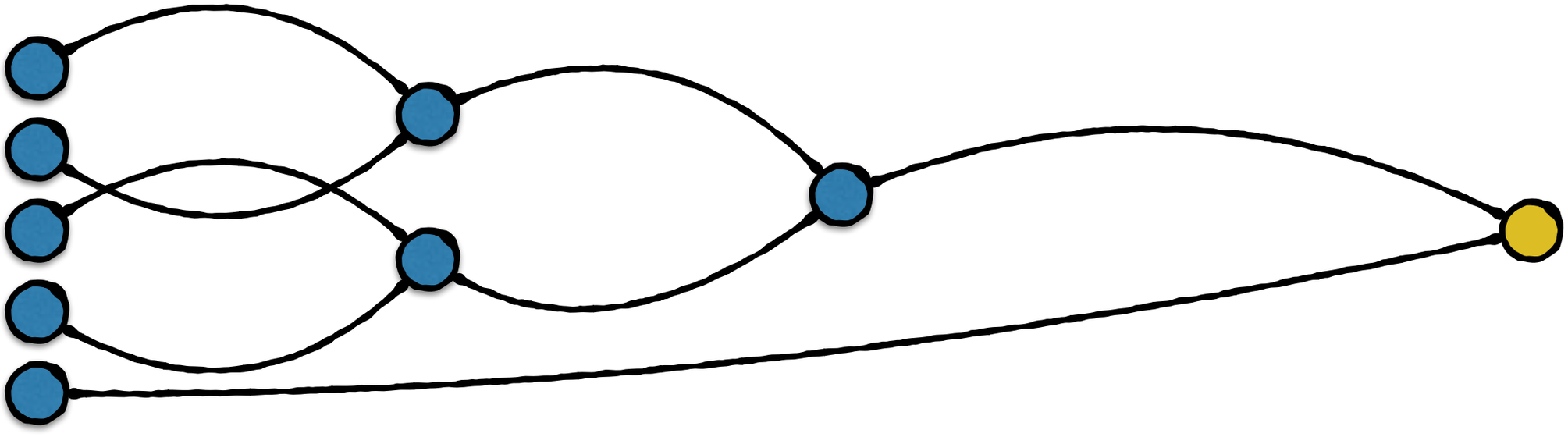
TOURNAMENT

http://magiaeimagem.files.wordpress.com/2010/02/ingmar-bergman-the-seventh-seal.jpg

TOURNAMENT



- Two stages mode
  - first: all-against-all (round robin)
  - then: knockout



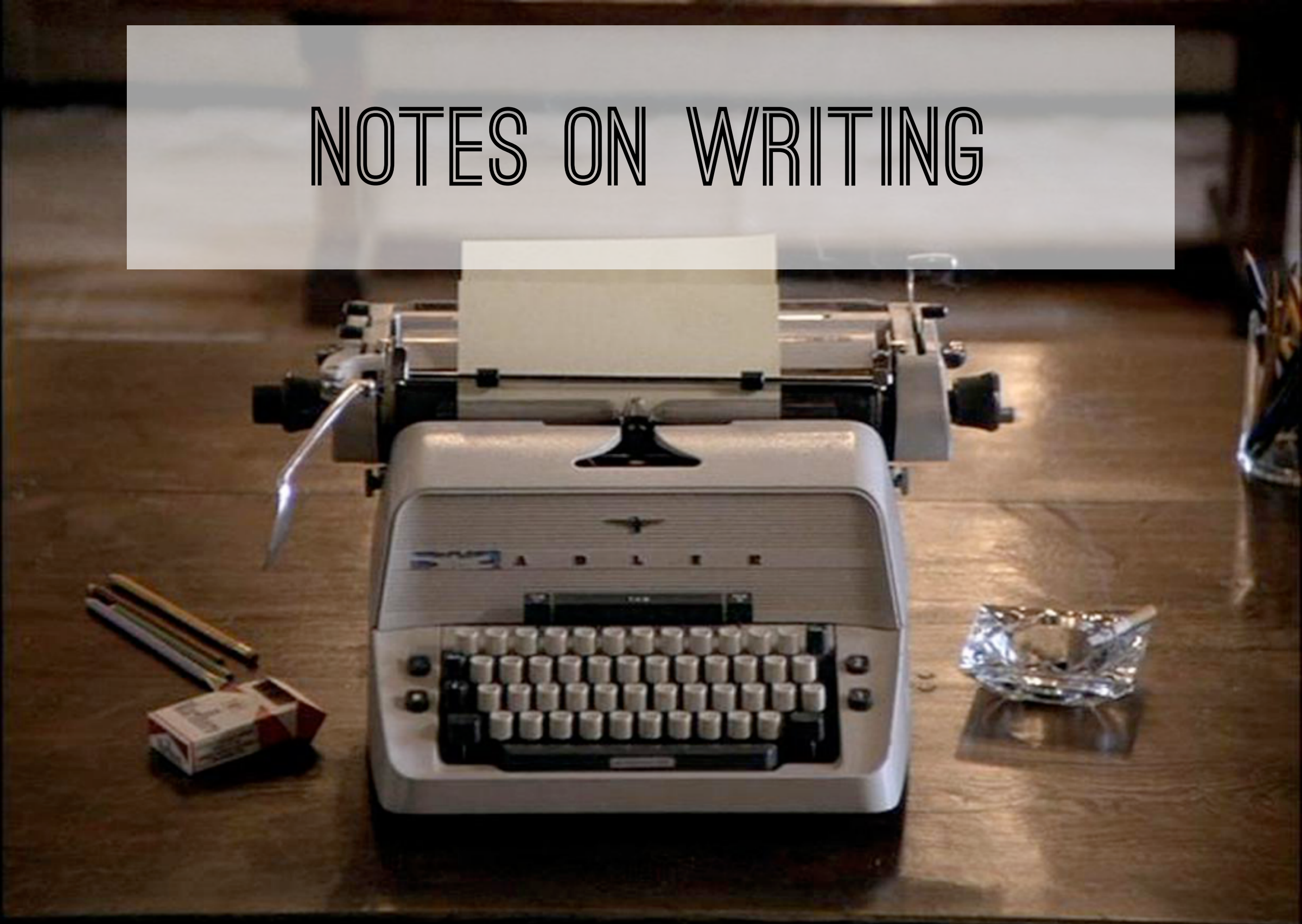
TOURNAMENT

- Clone the group repository
- It contains a module in team/. (Uses `__init__.py`)
- Exports a ‘team’ method:

```
def team():
    return SimpleTeam("The Winners", MyPlayer(),
MyPlayer())
```

- Run it as
  pelita groupN/team
- Additionally contains util and testing repositories
- Test with py.test or simply run ‘make test’
- Team can run on either side of the map. Quick test with ‘make left’, ‘make right’.

NOTES ON WRITING



http://verdoux.wordpress.com/2009/06/09/the-shining-1980/

NOTES ON WRITING

- Mazes don’t have dead-ends
- Hard to catch another bot which outruns you
- We’d like to see bots which combine their powers and attack from two sides
- Layouts are fixed and you can check them all before
- (There are pathological layouts in layouts/bad. Useful to find edge cases.)

NOTES ON WRITING

- Think about shortest-path algorithms
- Keep track of opponents
- Investigate communication between the Players
- Re-use your code
- Think about working in a team

NOTES ON WRITING

- Use the internal random number generator:
- instead of
  - random.choice
- you use
  - self.rnd.choice
- (more stable)

NOTES ON WRITING

- The match environment:
  - standard anaconda installation
  - also: pylint (just so you know)
  - additional packages may or may not be negotiable

TIMELINE

- Thursday 6pm–8pm: Group work
- Friday 2pm–6pm: Group work
- Friday 6pm: First report
- Saturday 8.30am–17pm: Group work
- Saturday 17.30pm: Final report and Tournament
- Thereafter: alcohol-fuelled discussions about that one bug that was responsible for it all

GETTING READY

- Clone the pelita and group repos:
  `git clone https://github.com/ASPP/pelita.git`
  `git clone https://github.com/ASPP/groupN.git`
- Install pelita:
  `pip install git+https://github.com/ASPP/pelita.git`
- Run a simple demo game:
  `cd groupN`
  `pelita groupN/team`
- For help:
  `pelita --help`
- See the Pelita documentation:
  https://ASPP.github.io/pelita
- Questions? Ask the tutors.

REPO CLOSES

http://25.media.tumblr.com/tumblr_m3vmn8RTTH1qathv6o1_500.png

REPO CLOSES

SATURDAY, 5PM.

http://25.media.tumblr.com/tumblr_m3vmn8RTTH1qathv6o1_500.png

MOVIE STILLS

- ‘Them’ (1954, dir. Gordon Douglas)
- ‘The Ten Commandments’ (1956, dir. Cecil B. DeMille)
- ‘Det sjunde inseglet’ (1957, dir. Ingmar Bergman)
- ‘Smultronstället’ (1957, dir. Ingmar Bergman)
- ‘The Shining’ (1980, dir. Stanley Kubrick)
- ‘Pi’ (1998, dir. Darren Aronofsky)
- ‘Computer Chess’ (2013, dir. Andrew Bujalski)