

# Programming Contest

# Programming contest

- Many similar contests at MIT
  - 6.370
  - 6.270
  - MASLAB
  - Student-organized and student-run
  - One of the major ways MIT students learn
- Our contest is based on 1-day contest run by Trilogy as a recruiting event

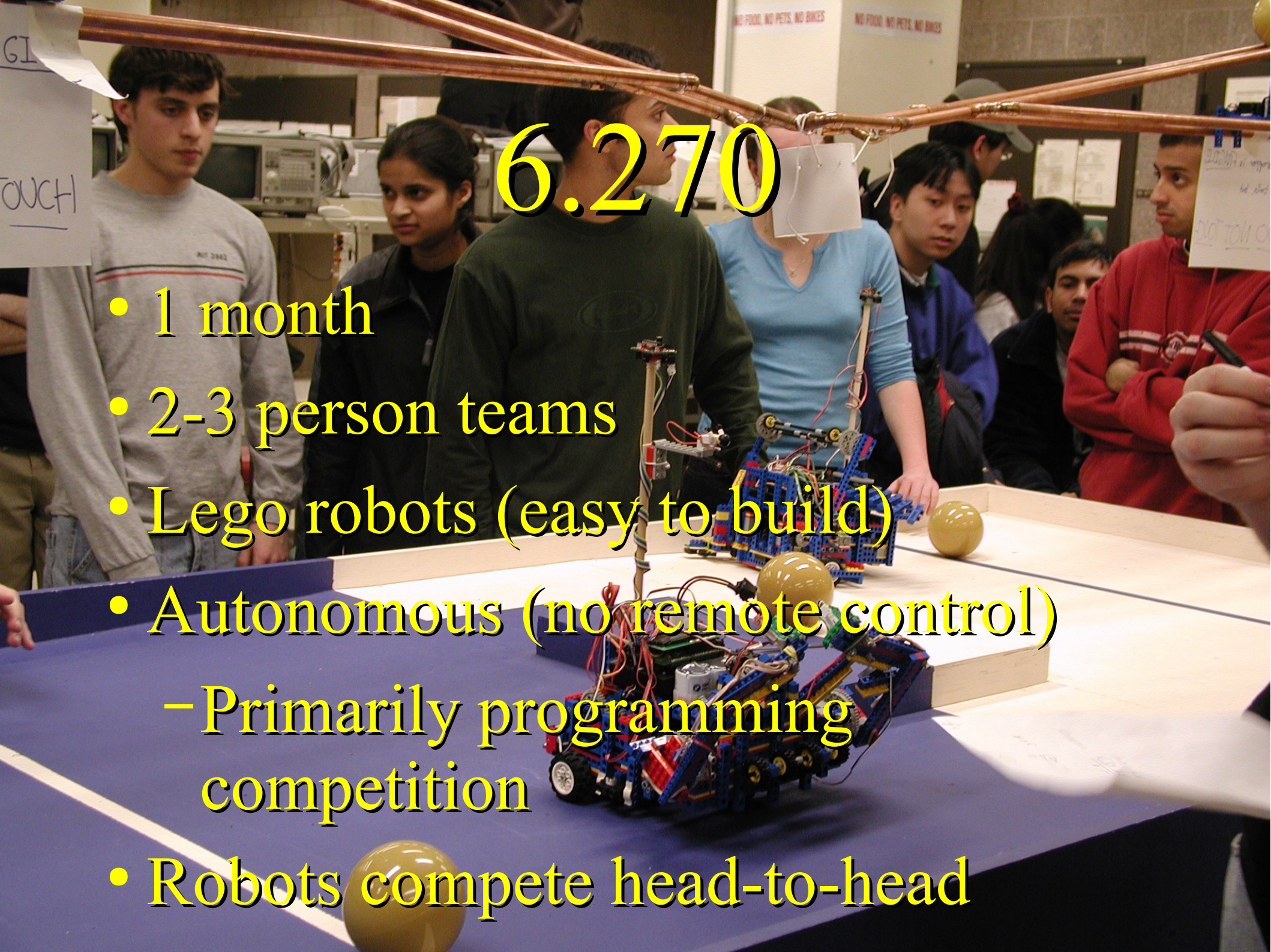
## 6.370

- Teams of students write programs that act as AIs in a videogame
- AIs compete against each other
- Videogame varies from year to year
- 1 month



# 6.270

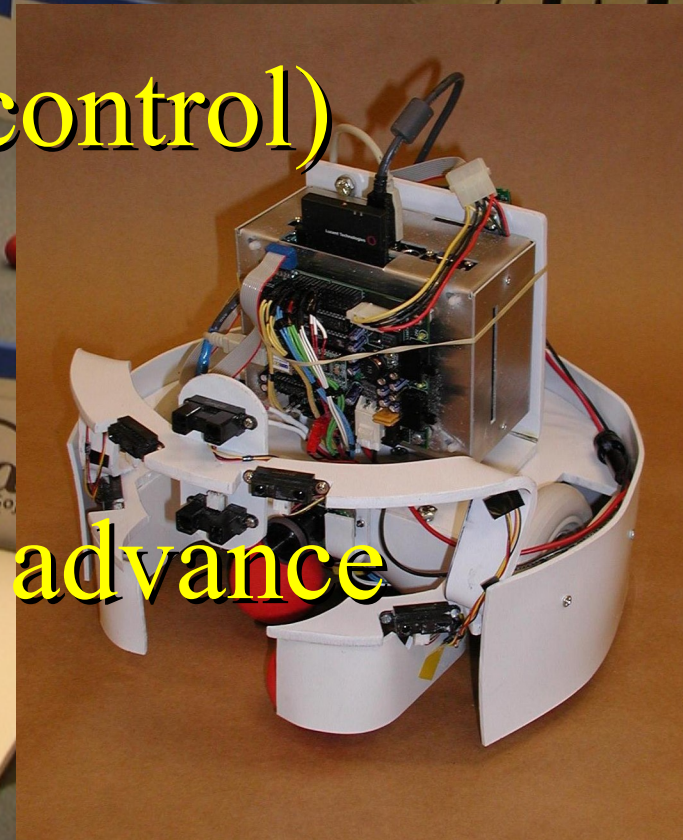
- 1 month
- 2-3 person teams
- Lego robots (easy to build)
- Autonomous (no remote control)
  - Primarily programming competition
- Robots compete head-to-head





# 6.186: MASLab

- 1 month
- 4 person teams
- Autonomous (no remote control)
  - Primarily programming competition
- Playing field unknown in advance
- Single robot on the field



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# Our contest

- Similar to Pacman
- Robots wander a maze, picking up points
- Robots can also shoot each other
- Hacked together quickly – fairly crude

# Game Overview

- 4 robots in a maze – each player controls 2 of them.
- Field starts full of points
- Robots moving over points collect points
- Robots may also shoot each other
- AIs may be disqualified if they take more than 1 sec.



# Sample game

```
      [0 0] [0 0]
XXXXXXXXXXXXXXXXXXXXX
XX...XX...XX...XX
XX...XX...XX...XX
XX.>.....XX...XX
XX...XX.....<.XX
XX...XX...XX...XX
XXX.XXXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
X...XX...XX...X
X...XX...XX...X
X.>.....XX...X
X...XX.....<..X
X...XX...XX...X
XXXXXXXXXXXXXXXXXXXXX
```

# Sample game

```
      [1 1] [1 1]
XXXXXXXXXXXXXXXXXXXXX
XX...XX...XX...XX
XX...XX...XX...XX
XX. >.....XX...XX
XX...XX.....< .XX
XX...XX...XX...XX
XXX.XXXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
X...XX...XX...X
X...XX...XX...X
X..^.....XX...X
X...XX.....< ..X
X...XX...XX...X
XXXXXXXXXXXXXXXXXXXXX
```

# Sample game

**[2 2] [1 2]**

```

XXXXXXXXXXXXXXXXXXXXXXXXX
XX. . . . XXX. . . XXX. . . XX
XX. . . . XXX. . . XXX. . . XX
XX.  v . . . . . XXX. . . XX
XX. . . . XXX. . . . . < . XX
XX. . . . XXX. . . XXX. . . XX
XXX. XXXXXXXXXXXXXXXX. XXX
XXX. XXXXXXXXXXXXXXXX. XXX
XX. . . XXXXXXXXXXXXXXX. XXX
XX. . . XXXXXXXXXXXXXXX. XXX
XX. . . XXXXXXXXXXXXXXX. XXX
XXX. XXXXXXXXXXXXXXXX. XXX
XXX. XXXXXXXXXXXXXXXX. XXX
X. . . . . XXX. . . XXX. . . . X
X. . ^ . . XXX. . . XXX. . . . X
X. . . . . . . . . XXX. . . . X
X. . . . . XXX. . . . . < . . X
X. . . . . XXX. . . XXX. . . . X
XXXXXXXXXXXXXXXXXXXXXXXXX

```

# Sample game

```
      [ 2 3] [ 2 3]
XXXXXXXXXXXXXXXXXXXXXXXXX
XX...XXX...XXX...XX
XX...XXX...XXX...XX
XX. ....XXX...XX
XX..V..XXX....< .XX
XX...XXX...XXX...XX
XXX.XXXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XX...XXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
X..^..XXX...XXX...X
X.. .XXX...XXX...X
X.. ....XXX...X
X....XXX....< .X
X....XXX...XXX...X
XXXXXXXXXXXXXXXXXXXXXXXXX
```



# Sample game

[3 4] [3 4]  
XXXXXXXXXXXXXXXXXXXXX  
XX...XX...XX...XX  
XX...XX...XX...XX  
XX. ....XX...XX  
XX..<.XX...< .XX  
XX...XX...XX...XX  
XXX.XXXXXXXXXXXXXX.XXX  
XXX.XXXXXXXXXXXXXX.XXX  
XX..XXXXXXXXXXXXX.XXX  
XX..XXXXXXXXXXXXX.XXX  
XX..XXXXXXXXXXXXX.XXX  
XXX.XXXXXXXXXXXXXX.XXX  
XXX^XXXXXXXXXXXXX.XXX  
X.. .XX...XX...X  
X.. .XX...XX...X  
X.. ....XX...X  
X....XX...< .X  
X....XX...XX...X  
XXXXXXXXXXXXXXXXXXXXX

# Sample game

```
      [ 3 5] [ 4 5]
XXXXXXXXXXXXXXXXXXXXXXXXX
XX...XXX...XXX...XX
XX...XXX...XXX...XX
XX. ....XXX...XX
XX.< .XXX.< .XX
XX...XXX...XXX...XX
XXX.XXXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
XX..XXXXXXXXXXXXX.XXX
XX..XXXXXXXXXXXXX.XXX
XX..XXXXXXXXXXXXX.XXX
XXX^XXXXXXXXXXXXX.XXX
XXX XXXXXXXXXXXXXXXX.XXX
X.. .XXX...XXX...X
X.. .XXX...XXX...X
X.. ....XXX...X
X....XXX.< ..X
X....XXX...XXX...X
XXXXXXXXXXXXXXXXXXXXXXXXX
```

# Sample game

```
      [ 4 6] [ 5 6]
XXXXXXXXXXXXXXXXXXXXXXXXX
XX...XXX...XXX...XX
XX...XXX...XXX...XX
XX. ....XXX...XX
XX. .XXX.< .XX
XX...XXX...XXX...XX
XXX.XXXXXXXXXXXXXX.XXX
XXX.XXXXXXXXXXXXXX.XXX
XX..XXXXXXXXXXXXX.XXX
XX..XXXXXXXXXXXXX.XXX
XX..XXXXXXXXXXXXX.XXX
XXX^XXXXXXXXXXXXX.XXX
XXX XXXXXXXXXXXXXXXX.XXX
X.. .XXX...XXX...X
X.. .XXX...XXX...X
X.. ....XXX...X
X.....XXX.< ..X
X.....XXX...XXX...X
XXXXXXXXXXXXXXXXXXXXXXXXX
```

# Order of play

- 1) Robots over points get points
- 2) Robots rotate and move
- 3) Lasers fire



# API

```
(define mouser-sys (mouser-init))  
(get-input mouser-sys)  
    ==> State of system  
(update-system commands)  
    ==> State of system  
(deinit mouser-sys)
```

# Suggestions

- Start simple
- Add strategy incrementally
- Cooperate with other teams
  - Test your robots against each other
  - Avoid secrecy