

# Voice-controlled Tic-Tac-Toe



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15-494/15-694: Cognitive Robotics

# About

Two robots playing tic-tac-toe

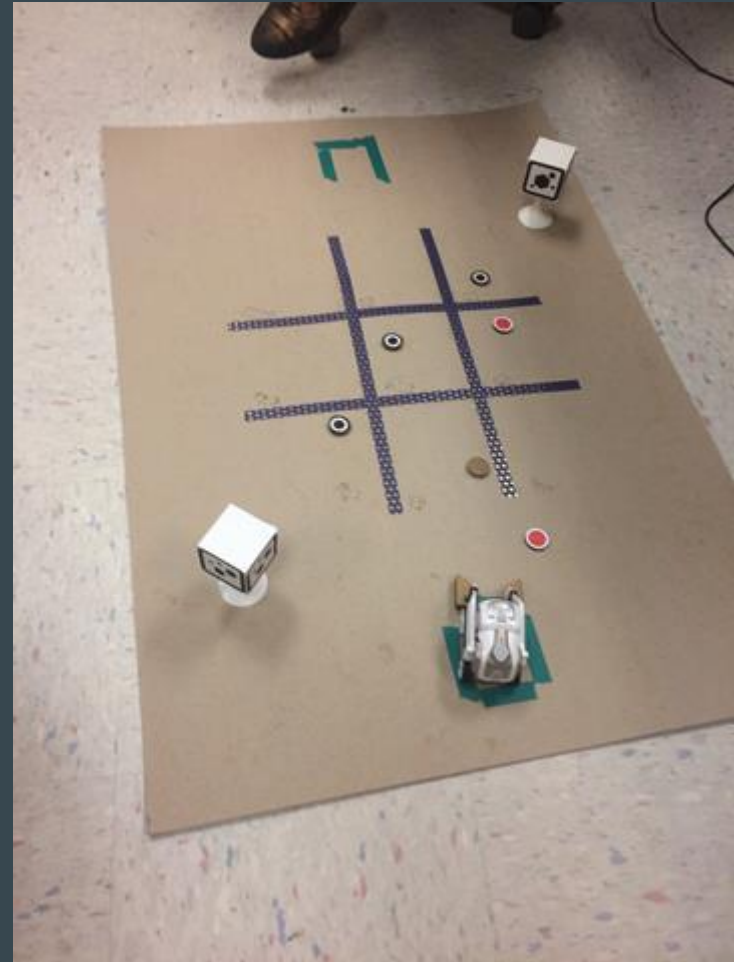
On a physical board.

Humans use speech to choose moves;

Robots recognize and execute

Manipulate physical game pieces

Cozmo understands game board,  
pieces, and game logic



# Challenges

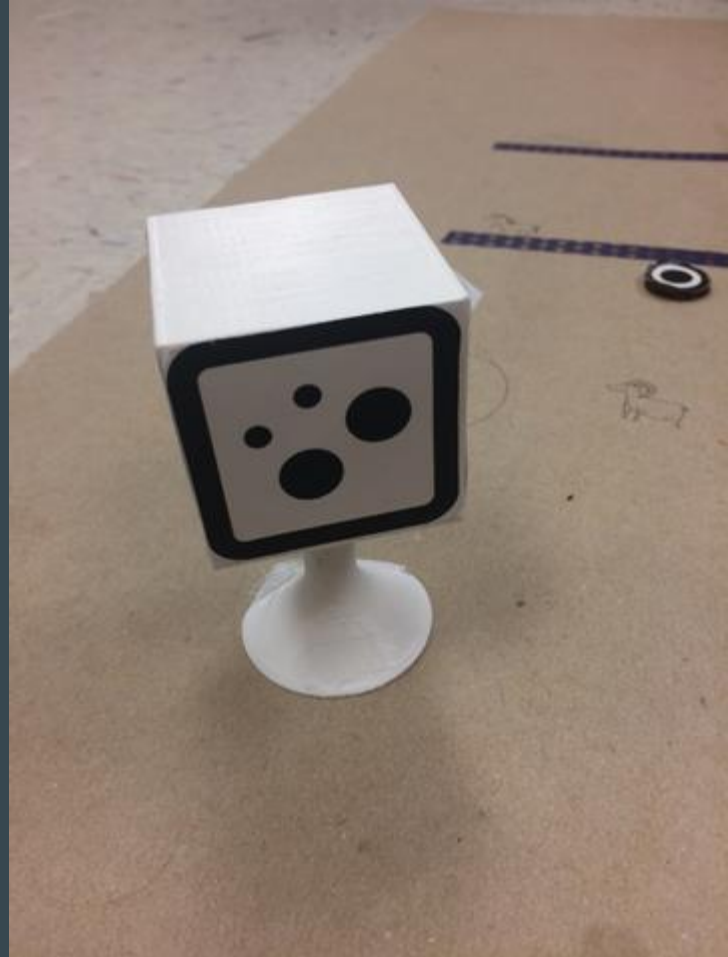
Size of board and squares

Planning around chip

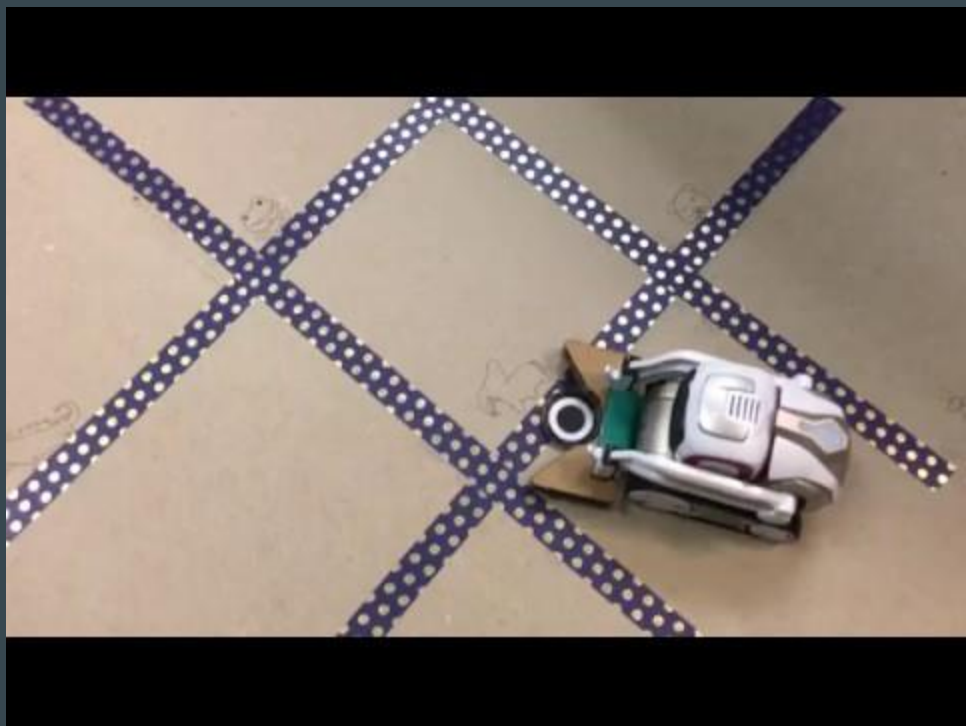
obstacles on the board

Speech

Board Mapping



```
31 square_names = ['antester', 'a1', 'bear', 'a2', 'cat', 'a3', 'dog', 'a4', 'fox', 'a5', 'goat', 'a6', 'horse', 'a7', 'pig', 'a8', 'sheep', 'a9', 'snake', 'a10', 'tiger', 'a11', 'wolf', 'a12']
32 squares = ['a1', 'a2', 'a3', 'b1', 'b2', 'b3', 'c1', 'c2', 'c3']
33
34
35 wid_c1 = 1001
36 wid_c2 = 1004
37 wid_c3 = 1005
38 wid_c4 = 1006
39
40 Terminal
41
42 2017-05-05 15:03:10,228 cozno.general WARNING ObjectStoppedMoving event received for unknown object ID 2
43
44 2017-05-05 15:03:15,638 cozno.general WARNING ObjectPowerLevel event received for unknown object ID 2
45
46 2017-05-05 15:03:15,770 cozno.general WARNING ObjectTapped event received for unknown object ID 2
47
48 Stupid
49
50 False
51
52 Speaking: 'Ready for next move!'
53
54 2017-05-05 15:03:33,993 cozno.general WARNING ObjectPowerLevel event received for unknown object ID 2
55
56 2017-05-05 15:03:49,564 cozno.general WARNING ObjectPowerLevel event received for unknown object ID 2
57
58 2017-05-05 15:04:03,604 cozno.general WARNING ObjectPowerLevel event received for unknown object ID 2
59
60 --> Got audio data: length = 7,567,360 bytes.
61 **** Audio segment too long. Try again.
62 --> Listening...
63
64 2017-05-05 15:04:20,027 cozno.general WARNING ObjectPowerLevel event received for unknown object ID 2
65
66 --> Got audio data: length = 1,323,008 bytes.
67 **** Audio segment too long. Try again.
68 --> Listening...
```



# Further Work/Interesting Tid-bits

Improved speech recognition

Global board that can be shared by multiple Cozmos

Although difficult, the speech recognition and progression of game logic based off that was definitely the most interest part of the project