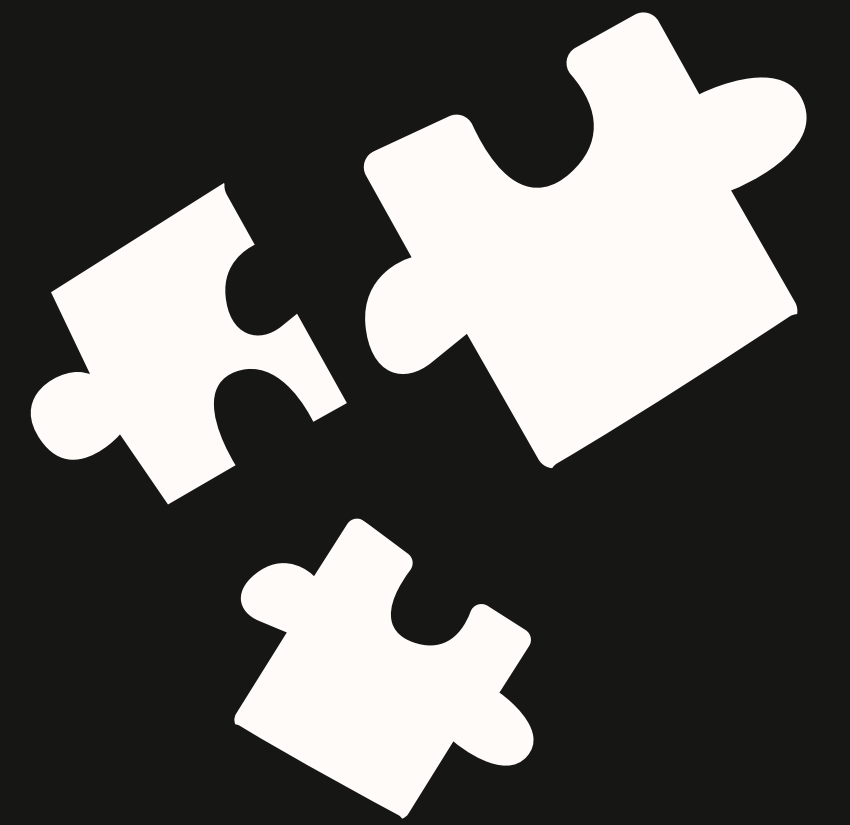


Escape Room

Co-operative Puzzle Solving



// The Game

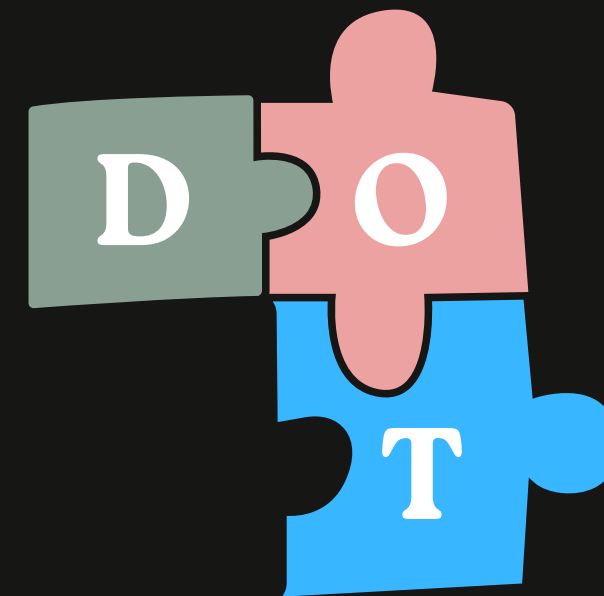


Cozmo is stuck in a Room and he can only leave with the correct password. Your task is to **guess the correct password** with the help of puzzles and hints Cozmo has set up in his room.



The Password

- » The password is a **3 letter word**.
- » Each letter is the answer to a puzzle, which Cozmo can unlock by **scanning an Aruco Marker**
- » There are also hints lying around the Shack which Cozmo can unlock by **grabbing a cube**



Components



Chat

Uses GPT API and user can ask any question

Scan Marker

Fetches question from a question-marker map.



PickCube

Picks up cube, drops it and unlocks hint from hint-cube map

Camera + Nav

Create screen with robot camera and stats. Allow robot to move with WASD and tilt head with IK

Decoder

Uses the Caesar cipher (shift = 3) to encode and decode any text

Pass

Checks for a password and enables DoorPass if the password is correct



Retrospective

Fun Aspects

- » Learning how to implement keyboard robot navigation with OpenCV
- » Trying to incorporate multiple robot actions (movement, path planning)
- » Coming up with puzzle ideas!

Not so Fun Aspects

- » GPT is TERRIBLE at encoding/decoding ciphers
- » PickUpCube doesn't always work perfectly
- » PilotToPose failed for navigating to a wall marker (GoalCollision). Didn't get enough time to work on this



Results

- » **Game works pretty much as expected!**
- » **Tested it out with some friends, they seemed to like the idea and decoding puzzles was fun with them**
- » **PickCube doesn't always work, Cozmo fails to pick up the cube some time if its at a bad angle**
- » **DoorPass doesn't always work, Cozmo tends to get stuck in the Doorway.**

Future Work



- » **Make more complex puzzles**
- » **Figure out translation to move to marker**
- » **Implement Speech to have a more smooth interaction**

Thanks for tuning in!
It's time to watch
Cozmo in Action.

Demo