



Cozmo's Kitchen

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The Project:

We turned
Cozmo into an
intelligent
kitchen assistant



Cozmo can:

- recognize ingredients
- generate a recipe for the given ingredients
- guide you along the recipe, step by step

Our Approach:



For ingredients:

Use GPT 4 to extract the ingredients and spices shown in Cozmo's camera frame and store it for future reference. Have Cozmo scan a fridge and recognize multiple ingredients.

For the recipe:

Given the available ingredients, use GPT 4 to generate a recipe and have Cozmo interactively guide you step by step using speech recognition and Cozmo's default speech, giving more instructions upon request.



Challenges Faced:

1. limits of the camera resolution:

- we would like to have it scan a whole pantry or fridge and have enough resolution to still see the contents

2. limits of speech recognition:

- in noisier environments, it is harder to pick up on the exact request
- have to say cozmo everytime as trigger word

3. difficulties with character limit of the say node:

- solved the issue by separating the string creating a recursive say function

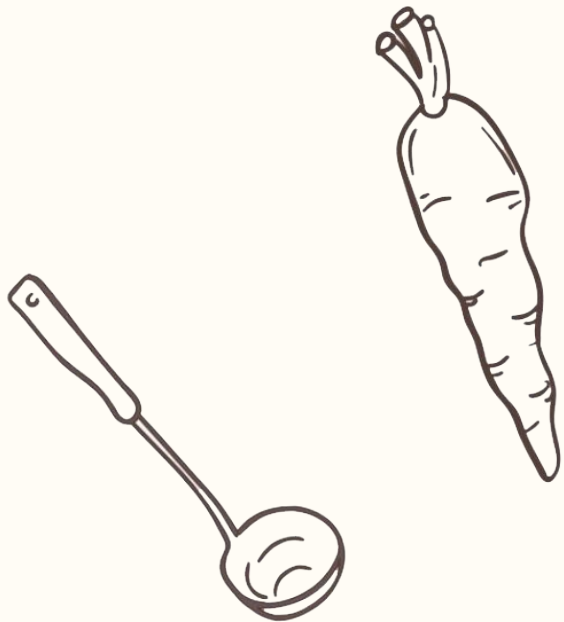




What We Learned about GPT

- Our first prompt was very long and difficult for GPT to follow because there were too many rules, such as giving directions for an expert and listing steps one by one
- We learned that the prompt needs to be simple with an example
- We had to modify the prompt to get it to follow rules such as not giving all the steps at once, keeping answers short and concise, not using ingredients that don't make sense (e.g. putting a cookie in pasta), and not using ingredients that we don't have
- We discovered that GPT can't edit its own text once it has created it (e.g. it break up its text into substrings of less than 250)
- We tested the abilities of GPT's image recognition and the limitations of similar foods like apples and tomatoes, and it performed fairly well
- We also had to modify the prompt to get it to simply describe a food or spice the image and not the background or placement of the food





Ideas for Future Work

- Getting Cozmo to navigate a small kitchen and recognize ingredients as it navigates
- Creating a feature that can watch you cook and give corrections
- Adding a timer feature
- Using an image (of higher quality) of a whole fridge or pantry and listing all the ingredients on hand