Robo - cooking → Arduino based cooking instructions

Modifications:

- can use computer vision and maybe electronic glove to sense different actions and call actions

① Define cooking actions as set of arduino commands in code
② have circuit designed to operate with certain buttons

eg. cut → signals arduino to cut
slice (rotated cutting) → corresponding functionality
gather →
spices →

Extension → making recipes which call a bunch of actions in a package
Extension → publicly available software to write and store recipies

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Vision Lite → computer vision program which mimics existing functionality of metaverse and 3D editors like Blender

① Use CV to define instructions
↓
look for motion and position of sensors

"Zoom" , "Pinch" , "Drag" , "Rotate"
↳ zoom in at current camera angle — zoom out

② create website with 3D scans and models to edit this way

Tech: arduino sensor glove
Blender script for zooming in
Access to script writing
* Local Blender File or scene Lidar

Memory Management Extension for Vscode?

Air quality monitoring around campus
↳ Software side: create an app similar to weather app which houses information about different air qualities
↳ Hardware, I2C with sensors and arduino style connection

** Bonus: build sensor circuits from scratch

Vision Lite

Overall System Design:

Software

Blender (or appropriate 3D editor)
Blender Python and Blender Python console

VSCode
Libraries:
OpenCV
Numpy

Hardware

Computer Camera
Sensors

Misc:

Gloves

Software Design: Maybe we can use C++?

object → pose / action Calculation.py → takes in input from the camera / CV program and determines pose

main.py → from pose, determines appropriate action and then calls one of a few classes

zoom out / zoom in / change page, etc.

Large Scope:

[a —y→ b (via x)] indicates transformation from a to b via x software using y hardware

Functionality Design + I/O

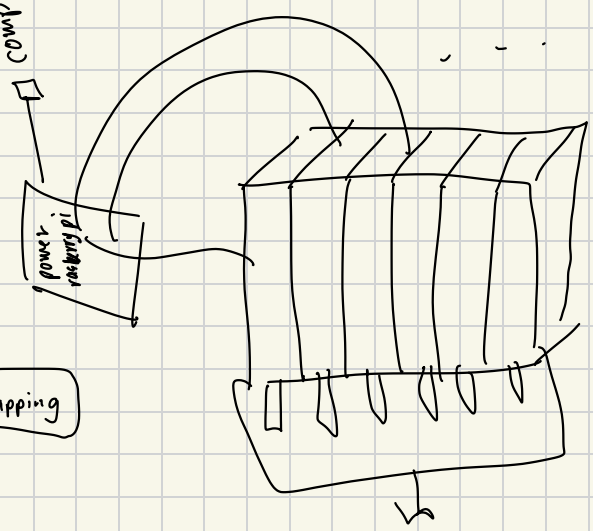
input: Hand + sensors → Camera (+ Arduino) / OpenCV → "Action" (classified into many different actions via OOP) → VSCode algorithms + numpy → function

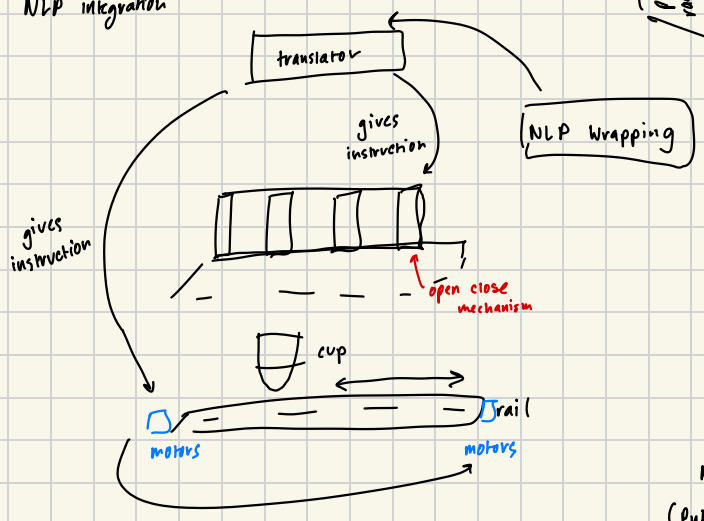
or Pretrained Machine Learning Model

a function could mean something like pinching into a screen, or moving right or changing tabs

NLP → comp.

Level 1: Buy build container → open close functionality
Level 2: Set time for dispensing drink + funnel
Level 3: integration with app
Level 4: NLP integration





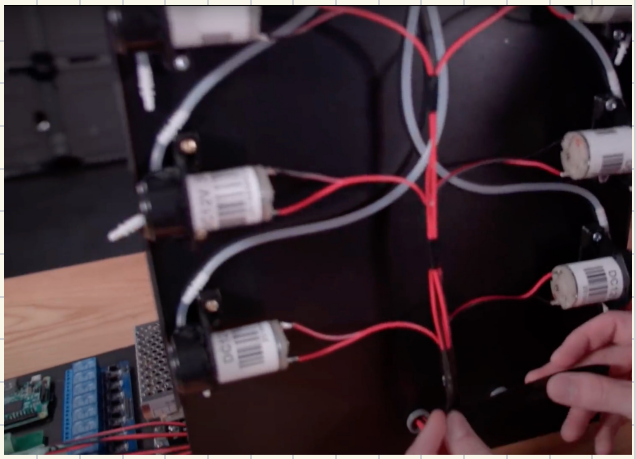
Software Diagram:

NLP Wrapping (Python → GPT API)

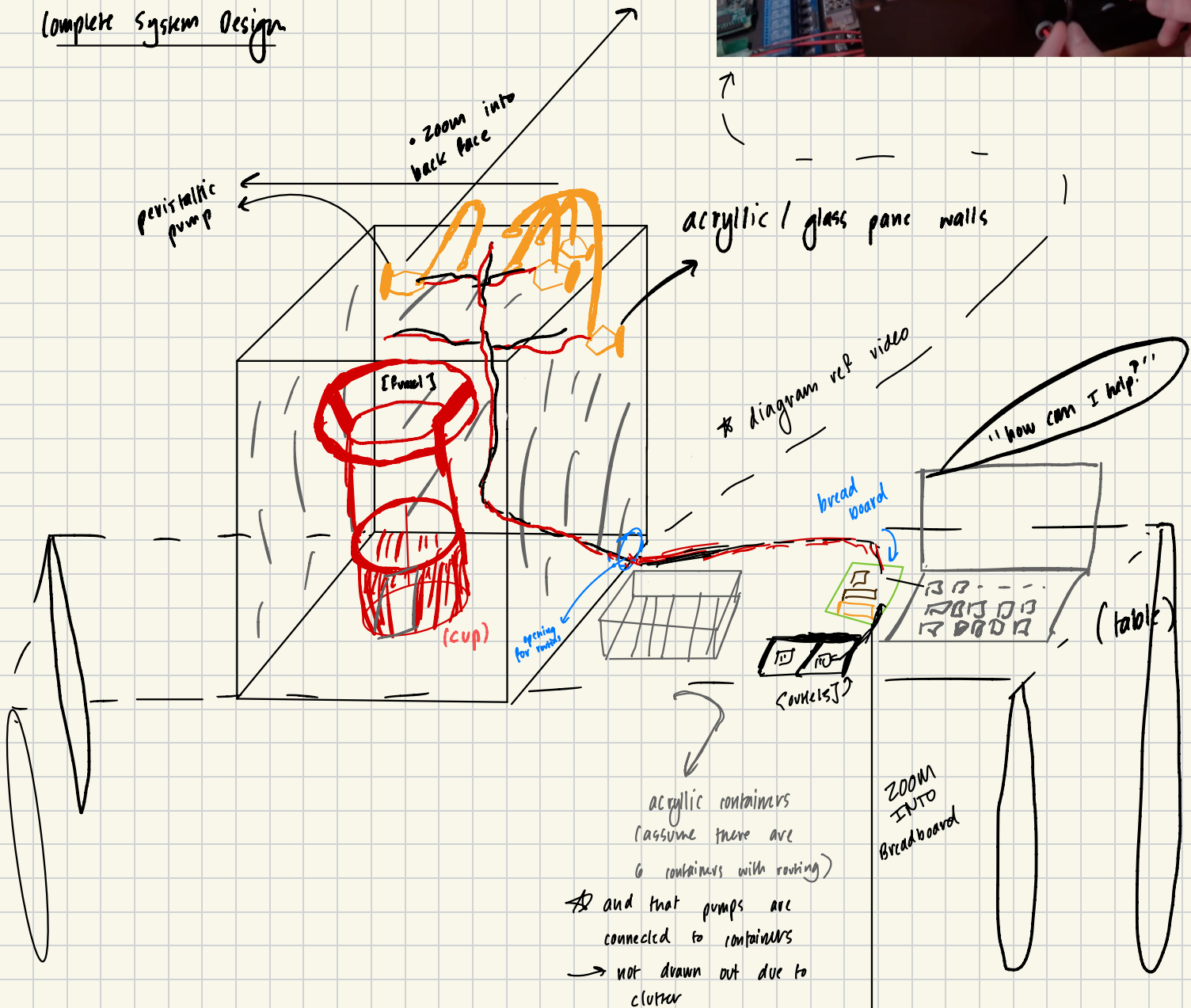
Software Diagram

gpt API run through RBP → translate into python scripts and dispensing array.

→ reference video

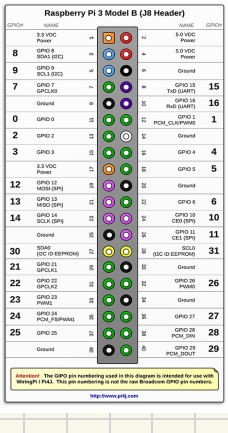


Complete System Design

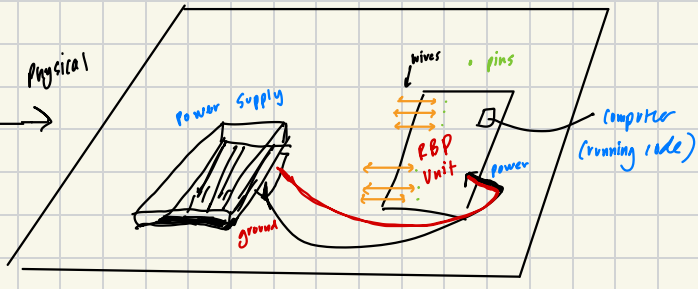


Circuit Diagram

Raspberry Pi Pin Out



Electrical ↔ Physical



Software

Architecture

Design and Descriptions

① openAI_methods.py

initializes token and computes response