

Automatic Cat Feeder

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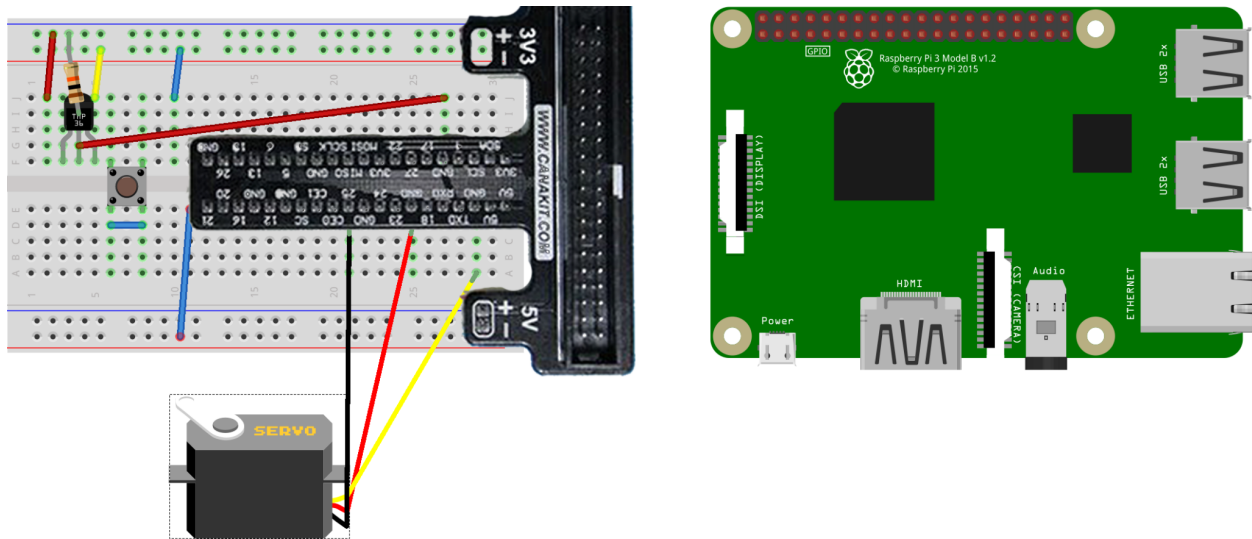
Automatic Cat Feeder

For our project, since we both have cats and painstakingly feed them multiple times a day, we had the intuitive idea to create an Automatic Cat Feeder. Since both of us have lives and responsibilities that prevent us from being home all day to operate the cat feeder, we also need a way to operate the feeder from outside our home. This led us to develop an IMAP email client that reads emails, looks for a specific subject heading, and operates the motor remotely. Our video demo can be found here: <https://youtu.be/SmadRVWbMsk>

We used the application Thonny to code our project on the Raspberry Pi in Python 3, and we used the libraries gpiozero for our GPIO, w1thermsensor for our temperature sensor, and imapclient for our email client. For our setup, we used a Servo motor connected to a knob on a cereal dispenser to act as our cat food dispenser. The motor is controlled by either email, or by button press. To initiate the motor through email, the user must send an email to samandorskarscatfeeder@gmail.com with subject heading 'feed cats'. Our email client checks every 5 seconds for unread emails containing the heading 'feed cats', and if found, runs the motor, sets the email as read, and then checks for button press. The button press has the same functionality as sending an email to our client, except that the button press does not work on the same 5 second cycle as our emails. Additionally, we have also setup a temperature sensor reading that can be requested via email to the same address as above, only with the subject heading 'get temp'. The client first checks for feed cats, then checks for get temp, and sleeps for 5 seconds afterwards. We both worked jointly on this project in person, so no work was split among us.

Our largest issue was the physical parts connecting the motor to the dispenser. We quickly found out that we need a way to stabilize the motor once activated. Our solution, although not present in our video demo (but will be in our live presentation) is to create a wood frame to stabilize both the dispenser and the motor using a couple bolts and a couple L-brackets. We also ran into the issue of sending confirmation emails when dealing with our email client. The idea was to send an email back after receiving a request once the motor finished its cycle. To read the emails, we used IMAP protocol, which is mainly for accessing emails and not sending. Our attempt was to use SMTP, which we got working on our local machines. However, when translating the code to our Pi, we ran into many issues, all regarding the connection from our Pi to SMTP. We discovered that the issue involved firewall permissions, of which we could not solve. This unfortunately led us to scrap the confirmation email idea.

Below is the schematic and setup we used for our Automatic Cat Feeder:



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