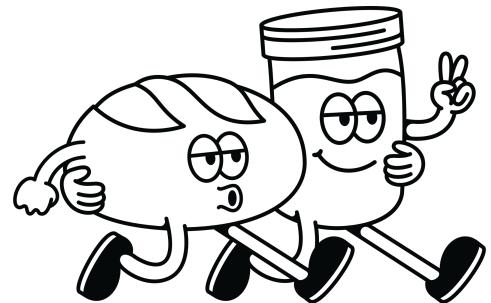


Breadwinner

A hardware driven community for sourdough.



Creative Commons → Kickstarter → Y Combinator → Sourdough

2005

2009

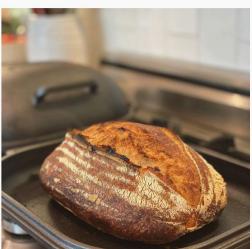
2016

2018

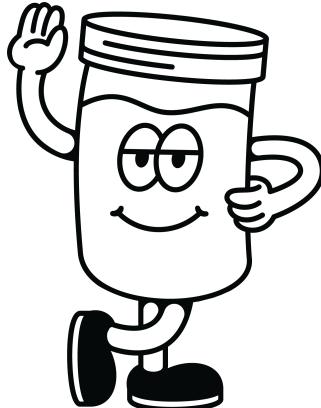


first sourdough loaf

I like to Bake



Why you should try sourdough



- It's how everyone ate bread up until the 20th century
- It's way **way** more fulfilling than buying bread
- It's something your entire family and friends will love
- Maintaining a starter is like having a pet that you eat
- Did I mention how excited your friends and family will be?
- Fermentation is beautiful



[reddit](#) [r/Sourdough](#)

Search

Posts Wiki

Posted by u/blessed 5 years ago

457 I built a device that tracks the "development" of the starter while I'm at work. The graph shows how the volume of the starter changes over time. I was wondering if other people would also find it useful :)

About Community

r/Sourdough

Want to learn about sourdough? Love homemade bread? Ask for sourdough advice, share knowledge/tips/recipes, have discussions, and post your bread pictures

141k Members 249 Online

Joined Create Post

Community Options

r/Sourdough Rules

1. Be polite & respectful
2. No submitting irrelevant content (off topic, memes, etc.)
3. No spamming
4. No self promotion

Submission Guidelines

Please provide a description of your process, ingredients, and/or the recipe when you post. This is strongly encouraged if your post has a visual component (e.g. photo or video). This makes it easier for others to help and replicate your bakes.

Moderators

Message the mods

- u/mrmmd
- u/bakingbadly
- u/jphx_a_0en
- u/bethelene
- u/autoModerator
- u/peppychick78
- u/desGroves

This thread is archived

New comments cannot be posted and votes cannot be cast

Sort by: Top

Classified 3 years ago My dude kick starter that baby yesterday!

121 Give Award Share Report Save

Hannah_Huskyn 1 year ago I second this

23 Give Award Share Report Save

hazelnut 1 year ago A motion has been passed and seconded. I call it a vote.

All in favor by the usual sign of 'aye'?

JUSTIN LAM [Blog](#) [Archives](#) [About](#) [Contact](#)

Monitoring the Fermentation of Sourdough Starter with Computer Vision

Posted on June 24, 2018 - 15 min read - 22 comments - #programming



Bread, the quintessence of life. People have survived for centuries off this staple consisting only of flour, water, salt, yeast. Try combining different ingredients creatively, and you'll be in for a delightful treat. However, bring them together and you do this: bread that makes the release of profound flavour, texture, and nutrients that were previously locked away.

Despite it being relatively easy to turn dough into something that looks and feels like bread, the challenge is in squeezing every possible ounce of flavor and texture using only those four ingredients to achieve the embodiment of a true loaf of bread. The secret to artisan bread is all in the preparation. A balance between hydration, temperature, and time is key to the fermentation process, which is usually achieved through countless months and/or years of trial and error.

But what if there was a better way to understand what happens during the fermentation process?

In this post, we dive into the world of wild yeast (commonly known as sourdough starter) by tracking its growth through timelapses, automated image analysis, and cool graph animations.

Read on to find out more!



Timelapse taken over ~10 hours at 5 minute intervals. Shown: Two sourdough starters with different feeding ratios.



The Backstory

For many centuries making artisan bread was slow and fermentative. If you can afford a long, slow rise, you will be rewarded with a texture like no other, and flavor that is both complex and subtle. Most bakeries unfortunately do not have this luxury (since it's a business after all), so commercial instant dry yeast is used to expedite the fermentation such that it reaches the desired loaf volume at a reasonable schedule. With bread risen with instant dry yeast, it will definitely resemble the qualities of bread, but the texture and taste will not be comparable to bread that uses wild yeast.

The quest for achieving the perfect loaf is an arduous one. It can take upwards of 12 hours from

[twilio / sourd](#) [Watch](#) 3 [Star](#) 61 [Fork](#) 5 [Code](#)

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master 1 branch 0 tags

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cmsunu28 Merge pull request #3 from aholmes... 8f7fc7f on Apr 28, 2020 20 commits

	enclosure	added all stls	12 months ago
	img	updated readme but no links	12 months ago
	rbiot-sourdough-monitor	added license	12 months ago
	.gitignore	with in-progress instructions and enclosure info	12 months ago
	LICENSE	added license	12 months ago
	README.md	Add a helpful link for fixing DFU on Windows 10.	12 months ago

README.md

sourd.io: An internet connected sourdough starter data monitor



Build an internet connected fitness tracker for your loaf

A sourdough starter is a little yeast-driven pet that eats flour and water and makes sourdough. More and more people are keeping these delightful critters in their houses, feeding them when they start to look sluggish and baking bread with them every few days.

With Twilio's Narrowband IoT Dev Kit, we can build a little monitor that helps us keep track of our starter's temperature, humidity, and rise.

Why Narrowband?

Twilio's Narrowband IoT Dev Kit happens to have some great sensors we can use to get started, and it's also designed for constant, low-power connectivity, which is what I want for this particular product. Cellular connectivity also means we don't have to do any setup or fight with our Wi-Fi routers.

About

sourd.io: temperature, humidity, and rise monitoring for your sourdough starter

[www.sourd.io/](#)

[Readme](#)

[Apache-2.0 License](#)

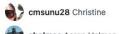
Releases

No releases published

Packages

No packages published

Contributors



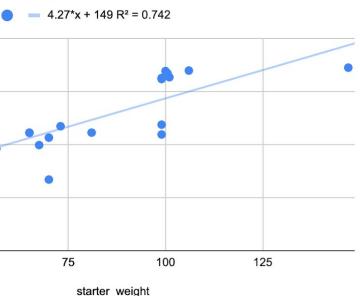
Languages



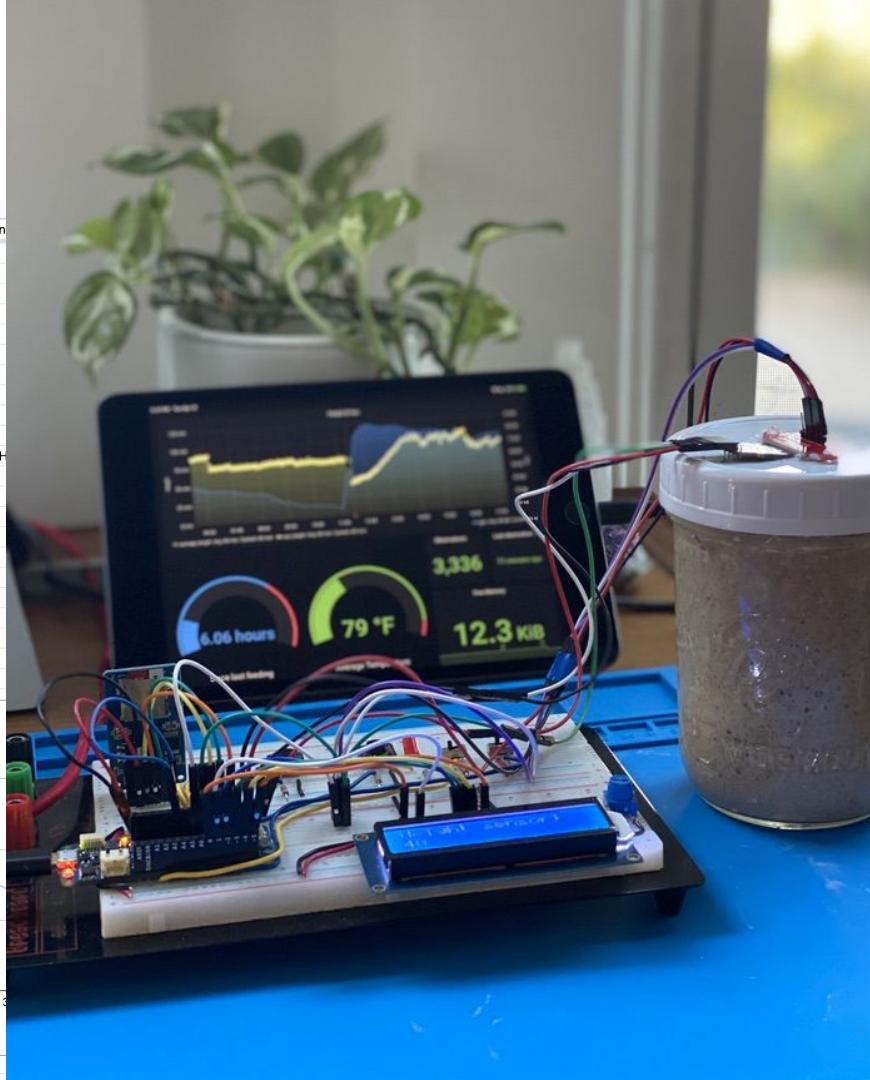
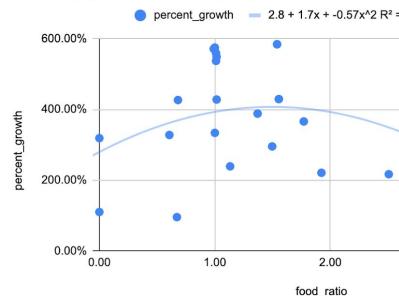
Early Days

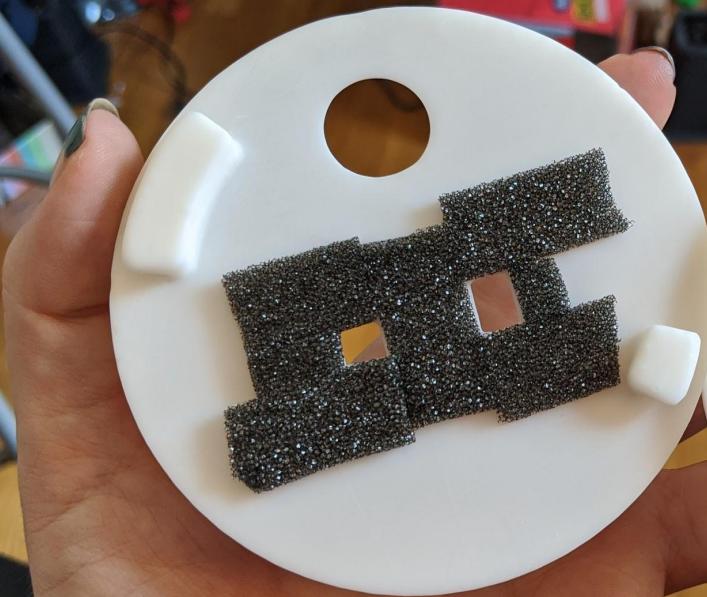
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
feedings_id	fed_at	min_height	max_height	distance	pre_feeding_weight	post_feeding_weight	starter_weight	food_weight	food_ratio	adjusted_percent_gr	percent_gr	projected	error	diff_time	n	
12	2020-03-18 0:28:30	195	439	244	351	252	99	100.5	1.02	57	428.07%	517.93	-78.93	19:12:36.000	1	
13	2020-03-19 17:15:00	202	306	104	286	252	33.5	101	3.01	64	162.50%	316.85	-10.85	16:46:30.000	1	
14	2020-03-20 9:36:08	205	353	148	304	252	52	100	1.92	67	220.90%	373.64	-20.64	16:21:08.000	1	
15	2020-03-20 11:26:00	191	385	194	308.5	252	57	100	1.77	53	366.04%	387.46	-2.45	01:50:01.000	1	
16	2020-03-20 10:56:4	187	297	110	278	378	252	26	100	3.85	49	224.49%	293.82	3.18	23:30:40.000	1
17	2020-03-21 22:41:3	196	445	249	317	252	65	101	1.55	58	429.31%	413.55	31.45	11:44:44.000	1	
18	2020-03-22 6:56:11	183	446	263	317	413	252	65	100	1.54	45	584.44%	413.55	32.45	08:14:38.000	1
19	2020-03-23 2:15:22	203	344	141	292.5	252	41	101.5	2.51	65	216.92%	338.34	5.67	19:19:11.000	1	
20	2020-03-23 17:39:4	204	399	195	319.5	418	252	68	101	1.50	66	295.45%	421.23	-22.23	15:24:25.000	1
21	2020-03-24 22:08:5	206	470	264	325	252	73	100	1.37	68	388.24%	438.11	31.89	04:29:08.000	1	
22	2020-03-25 22:46:3	243	691	448	399	252	147	100	0.68	105	426.67%	665.29	25.71	00:37:39.000	1	
23	2020-03-26 21:47:4	205	269	64		252	70	47	0.67	67	95.52%	428.90	-159.90	23:01:07.000	1	
24	2020-03-27 11:25:4	208	288	77	288	252	36		0.00	70	110.00%	324.52	-36.52	13:38:00.000	1	
25	2020-03-28 2:19:41	207	427	220	322	252	70		0.00	69	318.84%	428.90	-1.90	14:54:00.000	1	
26	2020-03-29 21:37:3	230	680	220	358	472	252	106	120	1.13	92	239.13%	539.42	140.58	19:17:49.000	1
27	2020-03-30 9:19:32	217	476	259	351	413	252	99	60	0.61	79	327.85%	517.93	-41.93	11:42:02.000	1
28	2020-03-31 8:28:54	218	648	430	351	449	252	99	100	1.01	80	537.50%	517.93	130.07	23:09:22.000	1
29	2020-04-01 7:57:51	215	655	440	353	451	252	101	100	0.99	77	571.43%	524.07	130.93	23:28:57.000	1
30	2020-04-02 8:45:48	216	652	436	351	252	99	100	1.01	78	558.97%	517.93	134.07	00:47:57.000	1	
31	2020-04-03 8:29:15	220	670	450	352.5	451.5	252	101	102	1.01	82	548.78%	522.54	147.47	23:43:31.000	1
34	2020-04-04 21:26:5	209	446	237	330	252	81	81	1.00	71	333.80%	462.67	-16.67	12:57:11.000	1	
35	2020-04-06 8:56:00	218	678	460	355	252	100	100	1.00	80	575.00%	521.00	157.00	11:29:30.000	1	

starter_weight vs. max_height



percent_growth vs. food_ratio







Breadwinner

Brendan April 5th, 2021

No Knead Beginner Sourdough Bread

What went well?
Everything! This is maybe the best crumb I've ever had, super fluffy. [Read more](#)

Brendan's bake rating Crumb Crust Taste

★★★★★	★★★★★	★★★★★
-------	-------	-------

[View Brendan's bake](#)

70% hydration 53% unbleached all purpose flour 29% unbleached white bread flour



1 baker has made this

[I want to bake this](#)



Fred Benenson

[Log new Bake](#)[Create Starter](#)

6 Bakes

1 Starter



Brendan April 5th, 2021



No Knead Beginner Sourdough Bread

[Recipe Source](#)

Here's how Brendan rated their bake:

Crumb	Crust	Taste
★★★★★	★★★★★	★★★★★

What went well?
Everything! This is maybe the best crumb I've ever had, super fluffy.

What didn't?
Maybe leave it in the oven for two or three more mins

Other notes
First bake in my new house!

Yeast Likely to Succeed
Born July 26th, 2020
150% Hydration level

Ingredient	Weight	Bakers %
Starter	180g	19%
Unbleached All Purpose Flour	500g	53%
Whole Wheat Flour	175g	18%
Unbleached White Bread Flour	273g	29%
Water	660g	70%
Salt	18g	2%
Hydration		70%

Bake gallery



Justin April 4th, 2021

Broa De Milho

What went well?
This cornbread looks beautiful when it comes out of the oven. The thick crispy c... [Read more](#)

Justin's bake rating Crumb Crust Taste

★★★★★	★★★★★	★★★★★
-------	-------	-------

[View Justin's bake](#)



Browse Recipes

Tags

active dry yeast bagel baguette biscuits buns butter buttermilk challah chocolate cookie corn flour crumpets dessert discard egg flatbread focaccia gluten-free herbs honey instant yeast milk multigrain no knead pancakes pizza portuguese potato bread rye rice bread sandwich bread scones seeds soda bread vegan white whole wheat whole grain

Recipes



A Simple Focaccia
by Maurizio

[Bake this](#)

[Recipe Source](#)

🕒 19 hrs 15 mins

sourdough focaccia vegan herbs



My Best Sourdough Recipe
by Maurizio

[Bake this](#)

[Recipe Source](#)

🕒 25 hrs 20 mins

sourdough bread whole wheat vegan levain high hydration



Tartine's Country Bread
by Tartine Bakery

[Bake this](#)

[Recipe Source](#)

🕒 48 hrs

sourdough bread whole wheat vegan levain

Create a new bake

[← Create a recipe, instead?](#)

No Knead Beginner Sourdough Bread by Joshua Weissman

[view recipe](#)

[Change recipe](#)

What kind of yeast or starter did you use?

Breadberry (fka Tim)

If you changed how you baked the No Knead Beginner Sourdough Bread recipe you can reflect those modifications in the settings below.

Loaves and Weight

Total Dough Weight How many? Weight per loaf

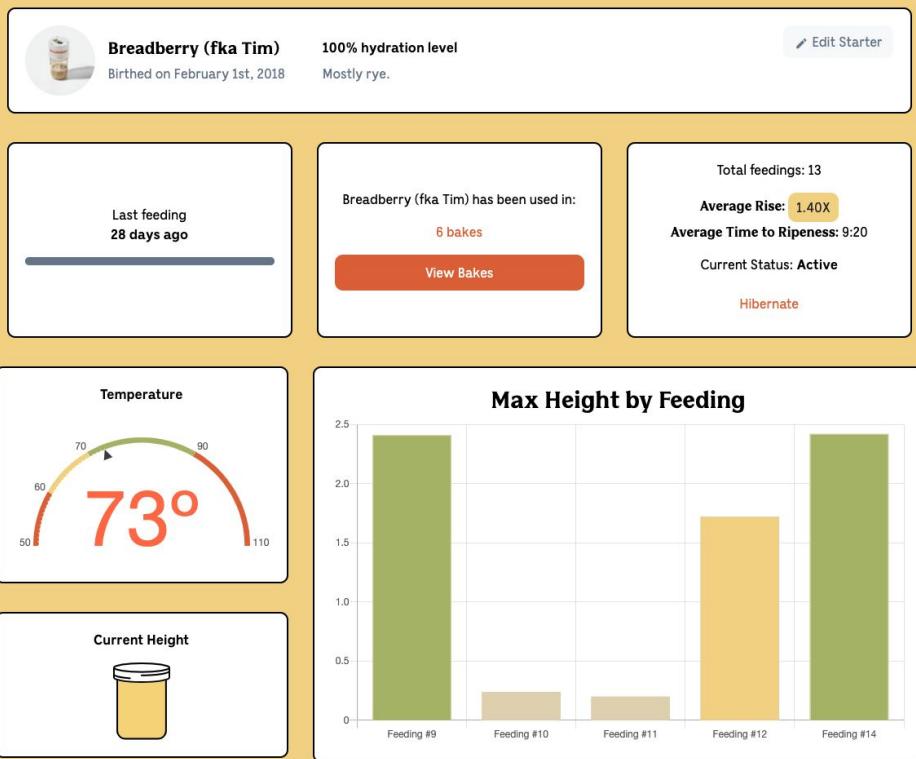
1806 grams 1 1806g
-25% +25%

Ingredients

Ingredient	Weight	Bakers %	
Starter	180 grams	19%	x
<input type="checkbox"/> Ingredient is flour			
Unbleached All Purpose Flour	500 grams	53%	x
<input checked="" type="checkbox"/> Ingredient is flour			
Whole Wheat Flour	175 grams	18%	x
<input checked="" type="checkbox"/> Ingredient is flour			
Unbleached White Bread Flour	273 grams	29%	x
<input checked="" type="checkbox"/> Ingredient is flour			
Water	660 grams	70%	x
<input type="checkbox"/> Ingredient is flour			
Salt	18 grams	2%	x
<input type="checkbox"/> Ingredient is flour			

[Add new ingredient](#)

[Reset](#)



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At 1 contributor

740 lines (665 sloc) 17.6 KB

```
Raw Blame ⌂ ⌂ ⌂
```

```
1 #include <Arduino.h>
2 #include <WiFi.h>
3 #include <WiFiMulti.h>
4 #include <HTTPClient.h>
5
6 #include <DNSServer.h>
7 #include <WebServer.h>
8 #include <WiFiManager.h>
9
10 #include <Adafruit_NeoPixel.h>
11
12 #include <SPI.h>
13 #include <SD.h>
14
15 #include <ArduinoHttpClient.h>
16 #include <ArduinoJson.h>
17
18 #include <Time.h>
19 #include <time1b.h>
20 #include <WiFiUdp.h>
21
22 // VL6180 Sensor Drivers
23 #include <Wire.h>
24 #include "Adafruit_VL6180X.h"
25
26 Adafruit_VL6180X vl = Adafruit_VL6180X();
27
28 // MCP9808 Sensor Drivers
29 #include <Adafruit_Sensor.h>
30 #include "Adafruit_MCP9808.h"
31
32 Adafruit_MCP9808 tempsensor = Adafruit_MCP9808();
33
34 String tempOffset;
35
36 /* Wifi Setup */
37 #include "constants.h"
38 int wifiStatus = WL_IDLE_STATUS;
39 WiFiClient wifi;
40
41 HttpClient client = HttpClient(wifi, API_ENDPOINT, API_PORT);
42
43 /* Sensor & LED & Button Setup */
44 int feedingButtonPin = 14;
45 int recordingSwitchPin = 32;
```

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674 lines (553 sloc) 34.3 KB

```
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```

```
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Version 3, 29 June 2007

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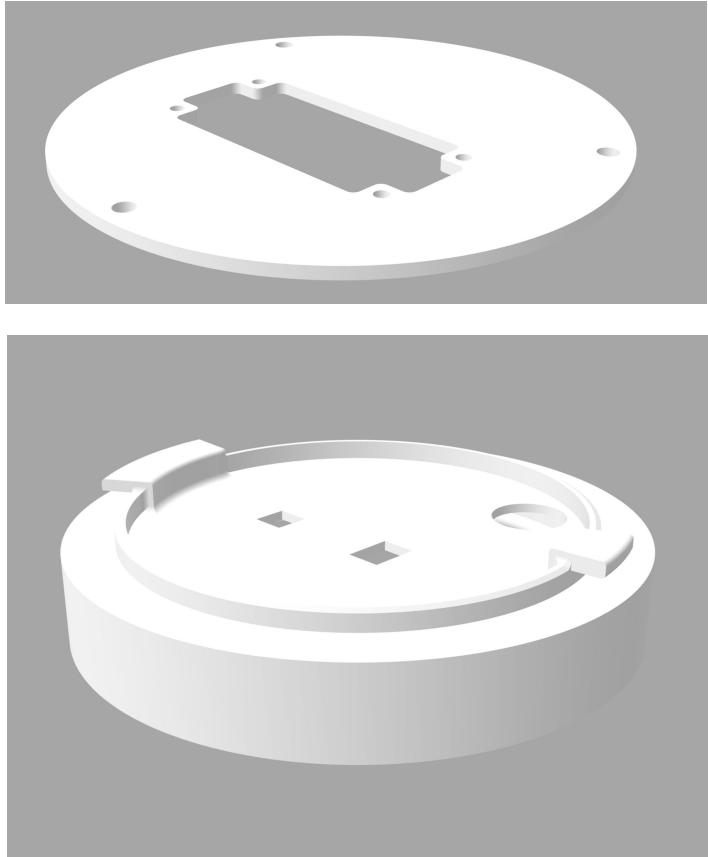
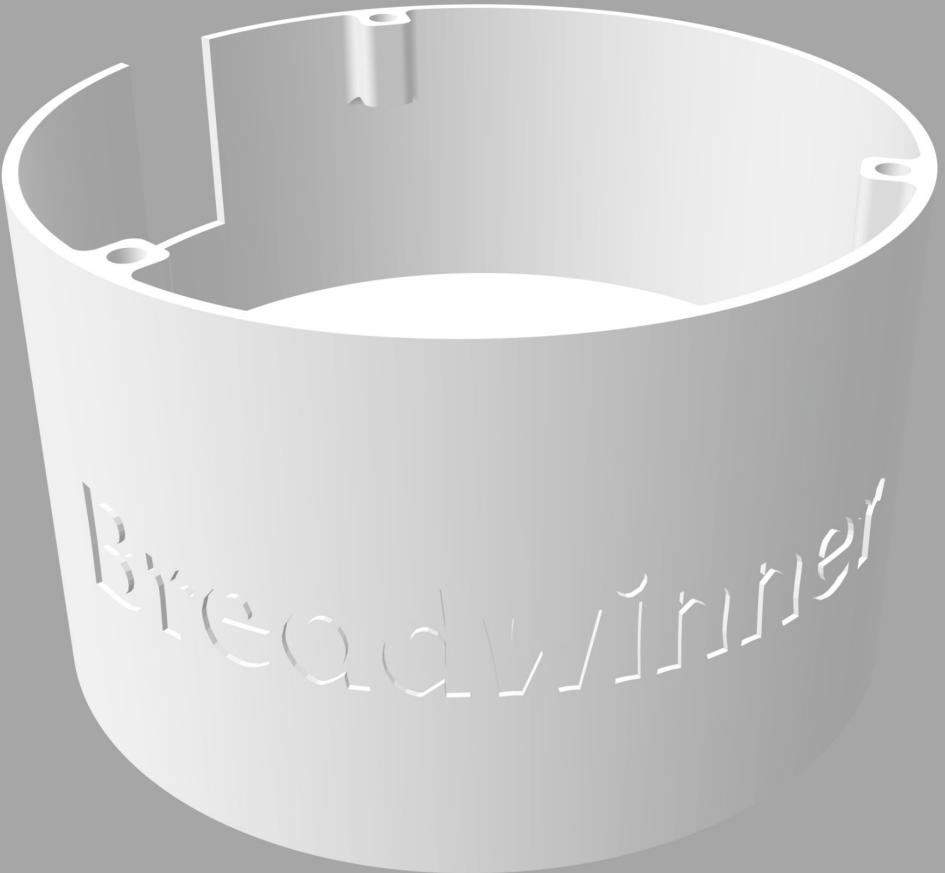
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```

<https://github.com/breadwinner-life/community-hardware>



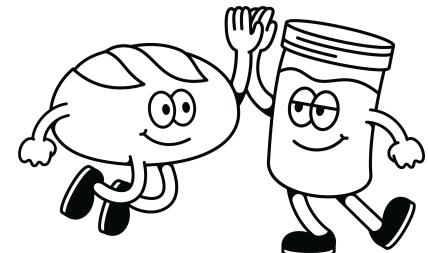
Sarah Pavis / [Measure Twice Labs](#)

Current Breadwinner BOM

- Feather Huzzah ESP32
 - Sensor - Time of Flight VL6180
 - Sensor - Temperature MCP9808
 - Feather Adalogger
 - 8gb Sandisk SD Card
 - Feather Proto
 - Long Female Headers - Feather
 - Short Male Headers - Feather
 - Neopixel breakout (5 pack)
 - Male/Male Jumper Wires
 - Buttons
-

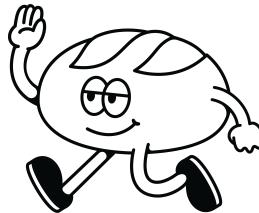
What this is

- A contribution back to the community that inspired me
- Some insight into how I've been building Breadwinner
- A cry for help writing firmware



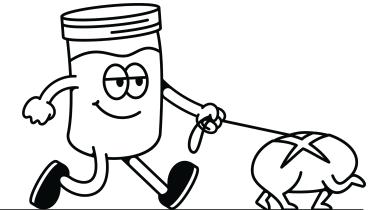
What this isn't

- Good Code That I Am Proud Of (it just works)
- Anything close to final or production code
- A “true” client for Breadwinner (no API access, yet)
- Very well documented



Help

- Let me know if you try this at home
- If you do, we can talk about API access



Data? Data.

There's a lot of interesting questions we can begin to ask and answer when we have lots of data from starters.

- Your starter's performance relative to the rest of the community (e.g. your starter is in the 98% for growth)
 - Correlate location and temperature with performance
 - Identify clusters & starters based on speed
 - Use bake ratings for “ground truth” on starter performance
-

Thank you

<https://github.com/breadwinner-life/community-hardware>

[@tryBreadwinner](#)

Questions? Answers?

Drop me a line: fred@breadwinner.life

