

every COOK



open hardware

Cooking gets digital

Food becomes transparent

And much more...



1 History of EveryCook

- 2008:** I need a cooking device that stirs and keeps a temperature precisely. Then my food doesn't get burned while I do a "quick mailcheck".
- 2009:** 3D model with improved features. I notice, that temperature regulation will need some software. What if I improve the software, add more sensors and WIFI?
- 2010:** More thoughts, more ideas and CAD models. People keep telling me: "No demand", "Not possible", "Lots of work"
- 2011:** First Prototype. It is possible. Usability is awful, need to make new hard- and software.
- 2012:** Two friends join in and help programming the database and interfaces. Second prototype of hardware. Database with many more features. I know: geeks will buy this first or build one themselves. Non-geeks will buy this later. Trolls will keep trolling...

2 Why EveryCook?

2.1 Vision

In order to eat well and healthy one requires a lot of information.

This information can be digitalized.

A recipe can be saved in such a way, that a machine can cook the food by itself. This food is healthier, more sustainable and better adapted to the eater than industrial food.

A central repository of all available information about food is important to promote decentralized structures. Transportation routes can be shortened and the situation of farmers can be improved.

Only when all food information is stored centrally and in a transparent, standardized way, the consumer really has a choice of what he eats.

A properly designed machine and software promote the creativity of the cook.

2.2 Mission

We develop hardware and software that support people in planning, procurement and preparation of their food.

We are developing transparently. The user can understand the product and adapt it if he likes to.

We do not conceal data. We do not deliberately build weaknesses into the hardware.

We have fun in developing new products and are always one step ahead. We do not patent our inventions.

3 What is EveryCook?

3.1 Hardware

We build our machines with the resources that we can financially effort. The current hardware is still in beta-phase.

The machine has been developed as a kit. Where possible, standard components were used. So we can produce small quantities at relatively low costs.

The hardware is open source. Anyone can download the plans and build the machine by himself. But whoever changes these plans or uses them to develop something new should share it with us.

The design has been uncompromisingly optimized for modifiability, robustness and repairability. Aesthetics will come later.

Features

We tried to build a simple machine, which can anyways do many things.

Therefore we took advantage of synergies where possible:

- If we have a heated pot, we dimension everything around it to be able to fry in it
- If we have a motor to stir, we can also use it to cut
- If we build a scale, we use 4 independent load cells. It simplifies mechanics and allows us to analyse the weight distribution in the software.

Actors:

- A induction heating with 1'500 W of power
- A motor with up to 195 rpm and up to 4 Nm
- A RC model servo to open the steam blowoff valve

Sensors:

- A ceramic pressure sensor for 0-2 bar relative pressure
- A PT1000 temperature sensor 0-300°C
- Four load cells, 0-5 kg each

Mechanics:

- A stainless steel pot with 5 litres volume tested for 1.2 bar relative pressure
- A cover made of high strength aluminium with stainless steel hinges and screws
- A stirrer made of stainless steel and Teflon made for 250°C
- Several cuttings disks in stainless steel to cut slices and stripes
- Stainless steel motor shaft, high temperature bearings and o-rings
- Overpressure and blowoff valve as combined unit completely in stainless steel
- Easy to assemble, disassemble and modify

Communication:

- A 7-segment module to show operating modes
- A piezo buzzer to say "weight reached" (or other messages)
- An embedded PC with WIFI and LAMP for the GUI

3.2 Software

The software from EveryCook is open source. It uses many proven tools and frameworks that are also open source. The whole project is hosted on GitHub. Everyone interested can join and help us.

We use:

- Yii Framework for PHP code
- jQuery for JavaScript
- Arduino and Leaf labs IDE for microcontroller programming
- Perl for the interface between the microcontroller and Linux
- Linux for the embedded computer running a LAMP

Our database is developed under the cc-by-sa license. If you want to access it you can do that and develop other smart cooking appliance. Who adds new records, shall share these with us.

Who wants to help us feeding the database with information is always welcome. The more information about food and recipes is available, the better for everyone who uses EveryCook.

We see in EveryCook a great opportunity to promote direct sales of food from producers to consumers. So if you know a farmer or food production place, please enter the food into the database and link it with recipes and producers. Then we will have less unnecessary shipping and get fresher food.

The nutritional value information has been provided by the USDA Nutrient Database. This is the only freely available database although almost every country maintains a nutritional value database. We will try to add more nutritional value data as soon as possible.

4 What will I speak about @ 29C3?

We estimate 10 minutes speaking time for each of the three topics. After each topic we will have 10 minutes of Q&A and so one hour should be fine.

4.1 Mechanics

- About laser cut sheet metal: some construction details
- About water and heat: why silicone rubber is great
- Motor: why we chose this one
- RC-Model servo motor: cheap, powerful, versatile but with drawbacks
- Thoughts about pressure and dimensioning
- Hardware improvements that will come in future designs

4.2 Electronics

- Reading sensors: why the scale is the biggest challenge
- Temperature sensor in an induction field: how to get reasonable results
- RC Servo and Sensor don't like each other
- Thoughts on improvements: what can be done with that platform?

4.3 Software

- The database: what data do we collect?
- Data sources we use
- The PHP side
- The JavaScript side
- The firmware
- How we connect PHP and hardware

5 What will we do @ 29C3?

5.1 Digital Cooking Workshop

We would like to bring 10 EveryCook machines (if we get them built till then) and let geeks cook with them. The users will have the opportunity to:

- Cook a digitalized recipe and suggest UI and Hardware improvements
- Create their own digital recipe, test and fine-tune it.
- Eat what they (and others) have cooked

5.2 Firmware Hacking

We will provide ssh access to the machines to selected geeks, so they can:

- Improve heater regulation based on temperature and pressure readings
- Get more accuracy on the scale through software algorithms
- Write code to use load cells to detect if cover is open or closed

5.3 GUI Hacking

All software is on GitHub. Everyone who has a LAMP on his laptop can get an instance running and test it. The modified software can be uploaded to one of the machines and tested.

Possible challenges are:

- CSS adaptations, more beautiful colors, other corner radius, fonts etc...
- GUI improvements: how to get to the result with less clicks? How to make it more intuitive?
- Designing better icons
- Looking for security issues

6 More Information and Pictures:

More information can be provided if needed. The present paper is kept short for providing a quick overview.

Other sources about EveryCook are:

<http://everycook.org> for the recipe database and

<http://everycook.org/cms/en> for the documentation and

<https://github.com/everycook> for the code

<https://plus.google.com/u/0/109523196764872874126/posts> for the latest news