

fritzing

Electronics made easy

What's fritzing!?

Industrial Arts

Artists

Chemistry “Magic”

Hands-on Science

Engineering

Makers

Musicians

Green Tech



DIY

Recycling

Tinkerers

S.T.E.A.M.

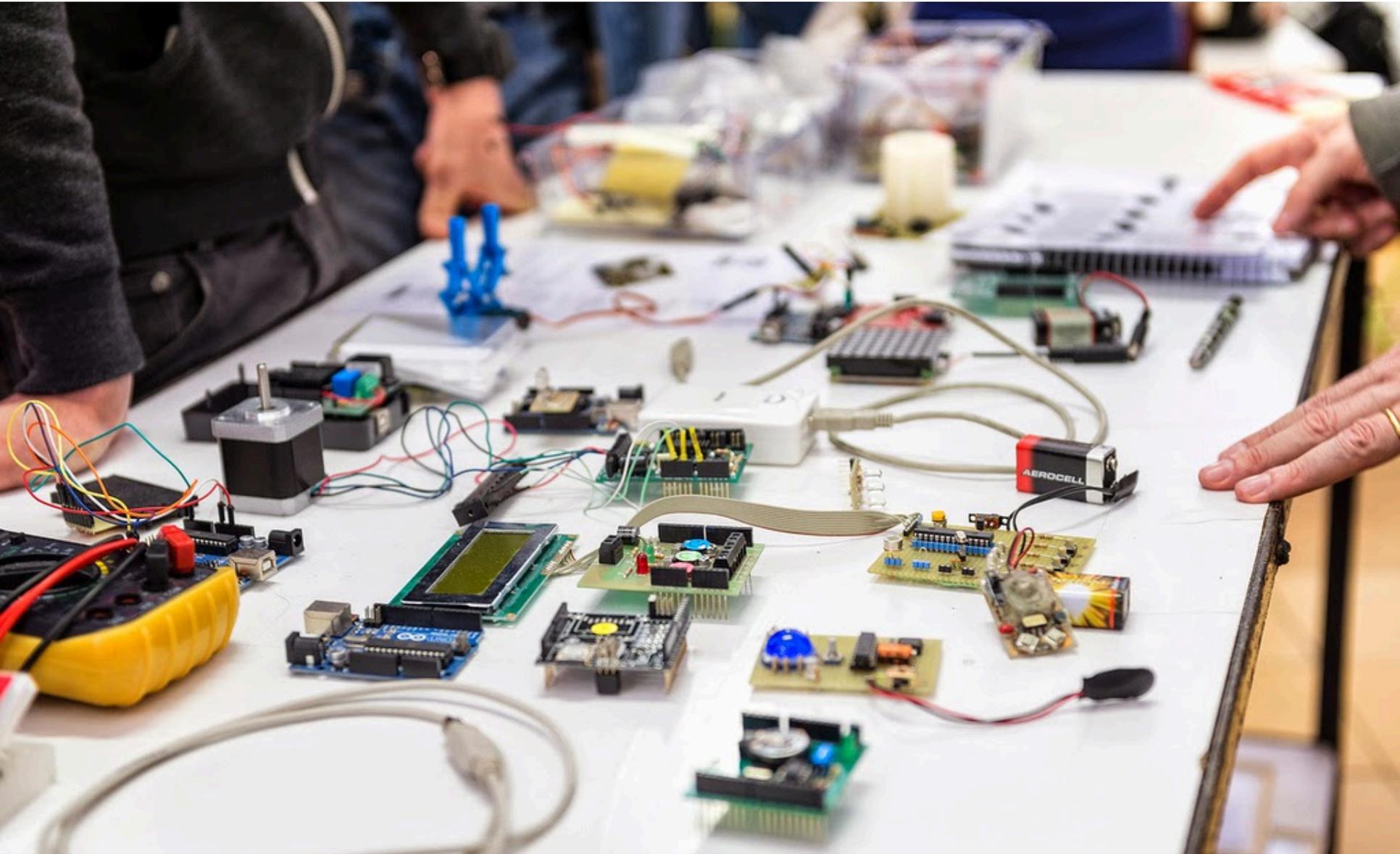
Alternative Energy

Young Makers

Robotics

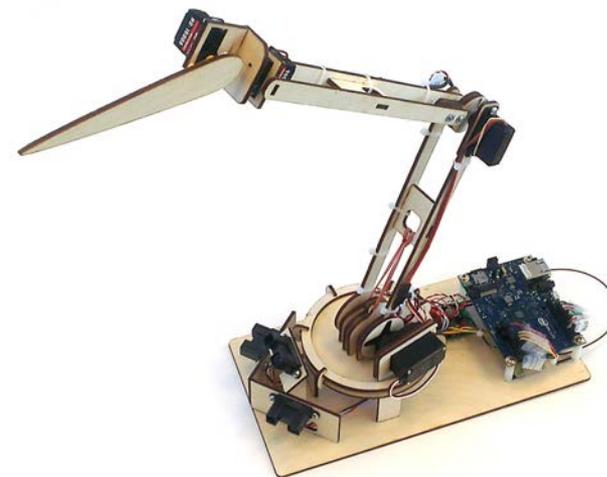
Digi-tech

Crafts



Creative Projects

fritzing



Demystify Electronics

Demystify Electronics
— & —
Democratize Innovation



Fritzing Software

fritzing

The screenshot displays the Fritzing software interface in 'Breadboard View'. The main workspace shows an Arduino Uno board on the left, connected to a breadboard. A large black grid component is placed on the breadboard, with numerous colored wires (yellow, green, blue, red) connecting it to the Arduino's pins. The top menu bar includes 'Welcome', 'Breadboard', 'Schematic', 'PCB', and 'Code'. The right-hand panel shows a 'Parts' list with 'Core Parts' and 'Input' categories. The 'Inspector' panel on the right shows the selected component is 'Arduino1', an 'Arduino UNO (Rev3)' with a version of 'v. 5'. The 'Placement' section shows the component is rotated 90.0 degrees and is locked. The 'Properties' section lists the family as 'microcontroller board (arduino)' and the type as 'Arduino UNO (Rev3)'. The 'Tags' section includes 'rev3, uno, arduino, atmega328'. The 'Connections' section shows the component is connected to the breadboard. The bottom status bar indicates 'Routing completed' and includes a 'Share' button. The bottom left corner has icons for 'Add a note', 'Rotate', and 'Flip'. The bottom right corner shows the zoom level at 136%.

Fritzing Software

fritzing

The screenshot displays the Fritzing software interface in Schematic View. The main workspace shows an Arduino Uno (Rev3) microcontroller board connected to two potentiometers, R1 and R2, both labeled as 100kΩ. The potentiometers are connected to the 5V and GND pins of the Arduino. The Arduino's digital pins are connected to various components: D0/RX, D1/TX, D2, D3 PWM, D4, D5 PWM, D6 PWM, D7, D8, D9 PWM, D10 PWM/SS, D11 PWM/MOSI, D12/MISO, and D13/SCK. The status bar at the bottom indicates 'Routing completed' and features a 'Share' button. The bottom-left corner contains navigation icons for 'Add a note', 'Rotate', 'Flip', and 'Autoroute'. The bottom-right corner shows a zoom level of 300%.

Fritzing Software

fritzing

PingPong.fzz [READ-ONLY] - Fritzing - [PCB View]

Welcome Breadboard Schematic **PCB** Code

Parts

Core Parts

MINE Basic

CORE

CONTRIB

Input

Output

Inspector

Arduino1 v. 5

Arduino1

Placement

pcb layer top

location -2.693 2.050

rotation 0.0

Locked

Properties

family microcontroller board (arduino)

type Arduino UNO (Rev3)

part #

Tags

rev3, uno, arduino, atmega328

Connections

conn.

name

Rotate View from Above Both Layers Autoroute Export for PCB

Made with fritzing PING_PONG

Routing completed

Fabricate Share

0.797 2.479 in 304 %

Fritzing Software

fritzing

The screenshot displays the Fritzing software interface. At the top, the title bar reads "PingPong.fzz [READ-ONLY] - Fritzing - [PCB View]". Below the title bar are tabs for "Welcome", "Breadboard", "Schematic", "PCB", and "Code". The "Code" tab is active, showing the following Arduino code in a dark-themed editor:

```
int gameSpeed; // storing the current game speed

void setup(){
  for (int i=0; i<8; i++){ // all pins are outputs
    pinMode(rowPins[i],OUTPUT);
    pinMode(colPins[i],OUTPUT);
  }
}

void draw(){
  for (int y=0; y<8; y++){ // rowwise
    for (int x=0; x<8; x++){ // from left to right, entries are checked
      if (image[x][y]==1){ // if entry equals 1
        digitalWrite(colPins[x],HIGH); // the column pin is switched on
      } else { // else
        digitalWrite(colPins[x],LOW); // the column pin is switched off
      }
    }
    digitalWrite(rowPins[y],LOW); // switch the row pin to LOW (because it is the cathod of the LED LOW means ON)
    delayMicroseconds(1000); // stop the program for 1 seconds
    digitalWrite(rowPins[y],HIGH); // switch the row pin to HIGH (what means OFF)
  }
}

void update(){
  switch (gameState) { // switching game mode (called state machine)
  case 0: // new game
    memcpy(image,blank,sizeof(blank)); // clear screen
    gameSpeed=300; // set the game speed
    ballXPosition=3; // set ball position
    ballYPosition=3; // set ball position
    ballYSpeed=0; // ball should fly straight
    if (random(0,2)>0){ // but randomly left or right
```

On the right side, the "Parts" panel is visible, showing a search bar and a grid of components under "Core Parts". Below this is the "Inspector" panel, which shows the properties of the selected component, "Arduino1". The inspector displays the following information:

- Component: Arduino1 v.5
- Placement: pcb layer: top, location: -2.69, 2.050, rotation: 0.0, Locked
- Properties: family: microcontroller board (arduino), type: Arduino UNO (Rev3), part #: [empty]
- Tags: rev3, uno, arduino, atmega328
- Connections: conn., name, [empty]

At the bottom of the interface, there is a red toolbar with buttons for "New", "Open", "Save", "Platform" (set to "Arduino"), "Board" (set to "Arduino UNO"), "Port" (set to "Bluetooth-Incor"), "Serial Monitor", and "Upload". A zoom level indicator shows "304 %".

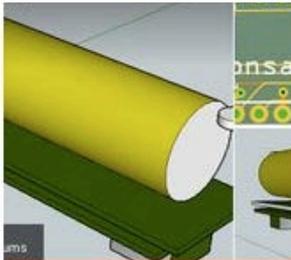
Community

fritzing



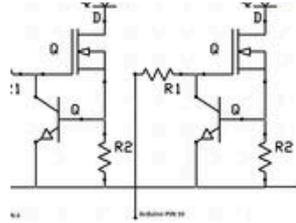
HAM radio parrot repeater

by pe2kmv



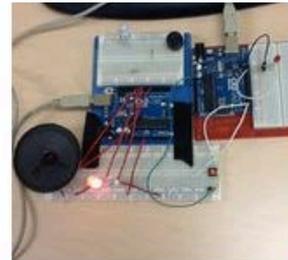
wixel bonsai tracker

by davidsingleton



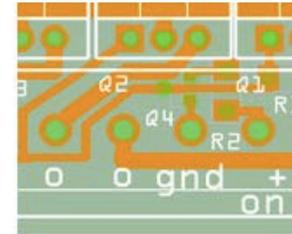
LED driver

by PhaseFocus



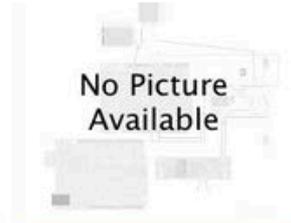
Police Lights, Siren, And Horn

by MSTRStudent



audi daytime automatic lights

by tomaskovackl



No Picture Available

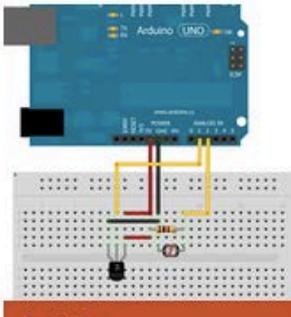
Sensor Inclinación Robot Arduino S4A Map

by robotarduedu



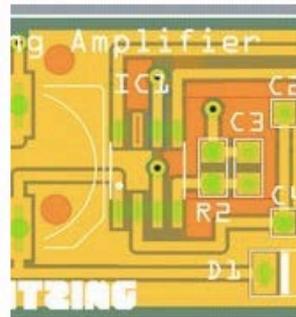
Touch My Piano

by ZackFreedman



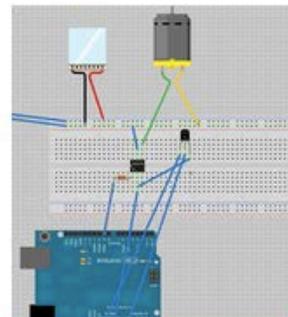
Arduino Senseboard

by noiseand



Fritzing Amplifier

by hdf_mjf_de



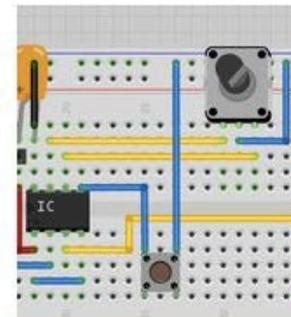
Cup Cooler

by mantaspats



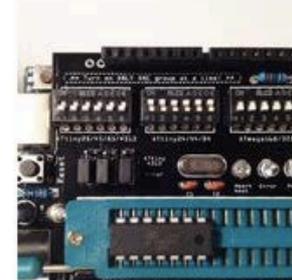
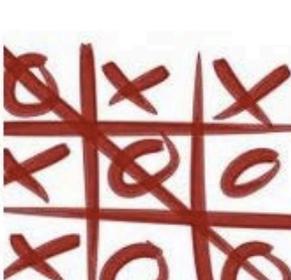
Arduino com servomotor robótico e display LCD

by ComoFazerAsCoisas



Digipot

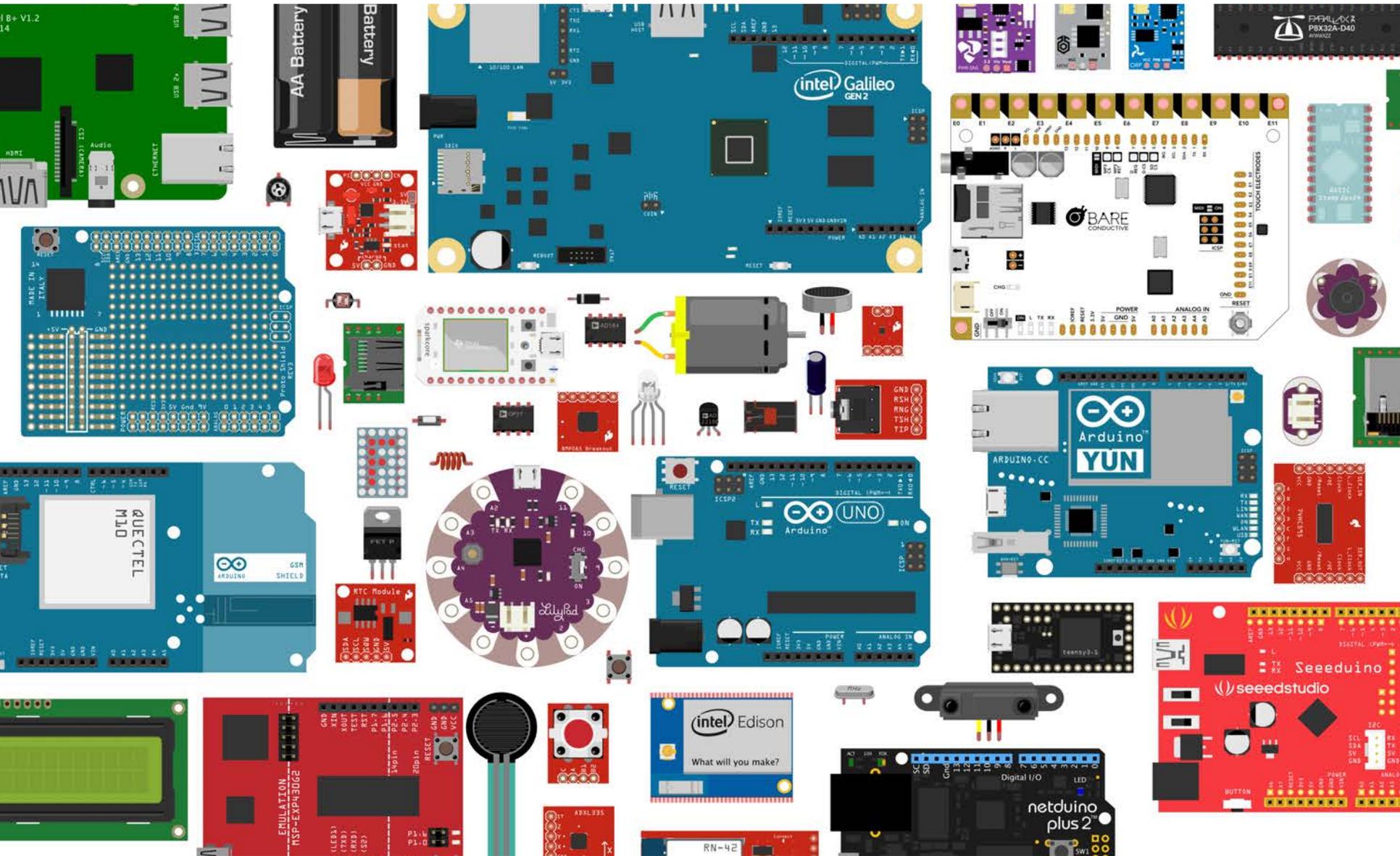
by Germa



Teleduino

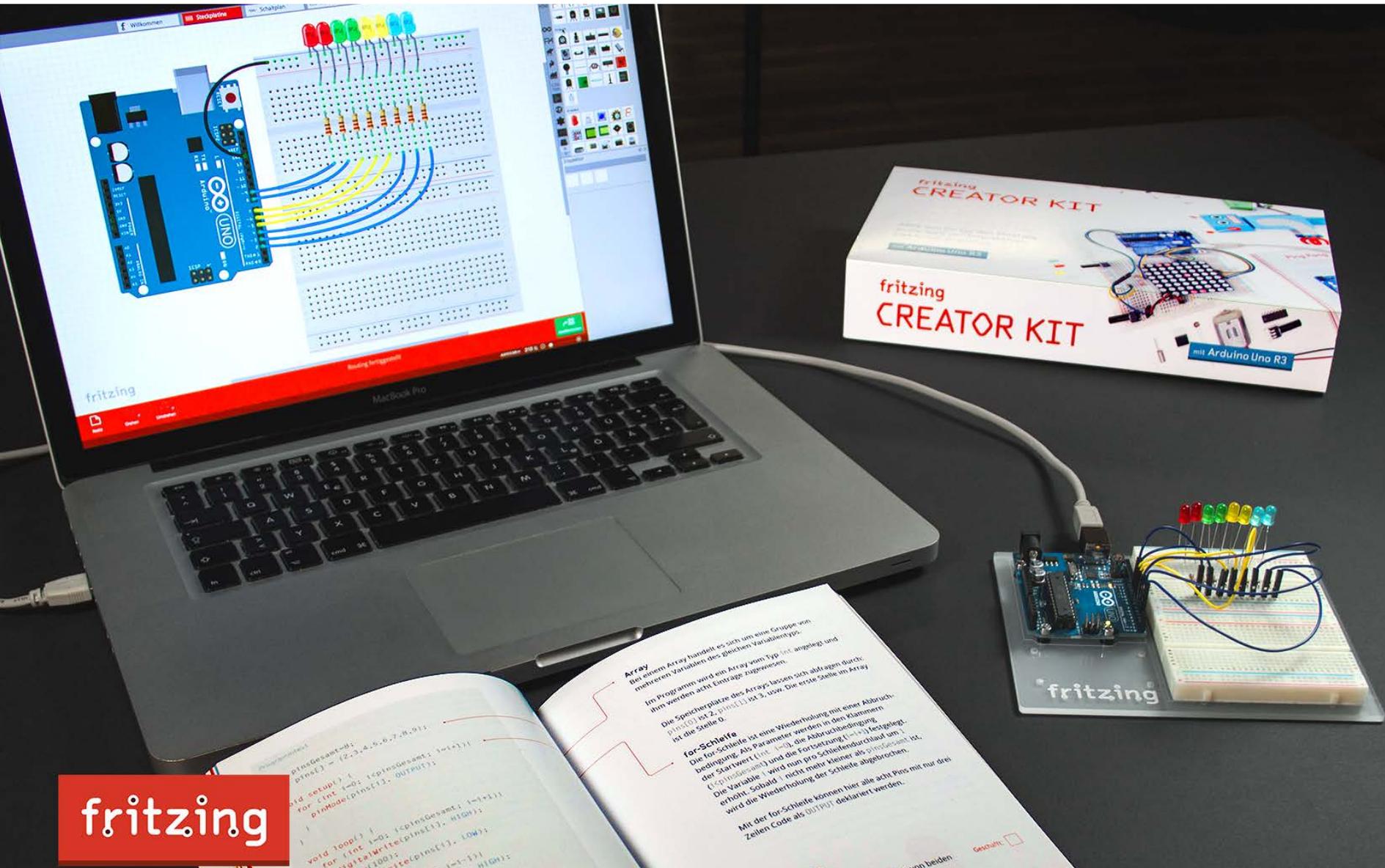
Parts Library

fritzing



Beginner's Kit

fritzing



fritzing

Array
Bei einem Array handelt es sich um eine Gruppe von mehreren Variablen des gleichen Variablentyps.
Im Programm wird ein Array vom Typ `int` angelegt und ihm werden acht Einträge zugewiesen.
Die Speicherplätze des Arrays lassen sich abfragen durch `pins[0]` bis `pins[7]` ist 3, usw. Die erste Stelle im Array ist die Stelle 0.

for-Schleife

Die for-Schleife ist eine Wiederholung mit einer Abbruchbedingung. Als Parameter werden in den Klammern der Startwert (`int i=0`), die Abbruchbedingung (`!pinsGesamt`) und die Fortsetzung (`i++`) festgelegt. Die Variable `i` wird nun pro Schleifendurchlauf um 1 erhöht. Sobald `i` nicht mehr kleiner als `pinsGesamt` ist, wird die Wiederholung der Schleife abgebrochen.
Mit der for-Schleife können hier alle acht Pins mit nur drei Zeilen Code als `OUTPUT` deklariert werden.

```
int pinsGesamt=8;  
int pins[] = {2,3,4,5,6,7,8,9};  
void setup() {  
  for (int i=0; i<pinsGesamt; i++){  
    pinMode(pins[i], OUTPUT);  
  }  
}  
void loop() {  
  for (int i=0; i<pinsGesamt; i++){  
    digitalWrite(pins[i], LOW);  
    delay(100);  
    digitalWrite(pins[i], HIGH);  
  }  
}
```

von beiden Geschalt



www.fritzing.org/creatorkit

fritzing

Blink

ROBOTER

DTM ROBOTER

Stelle deine Frage

ARDUINO

fritzing

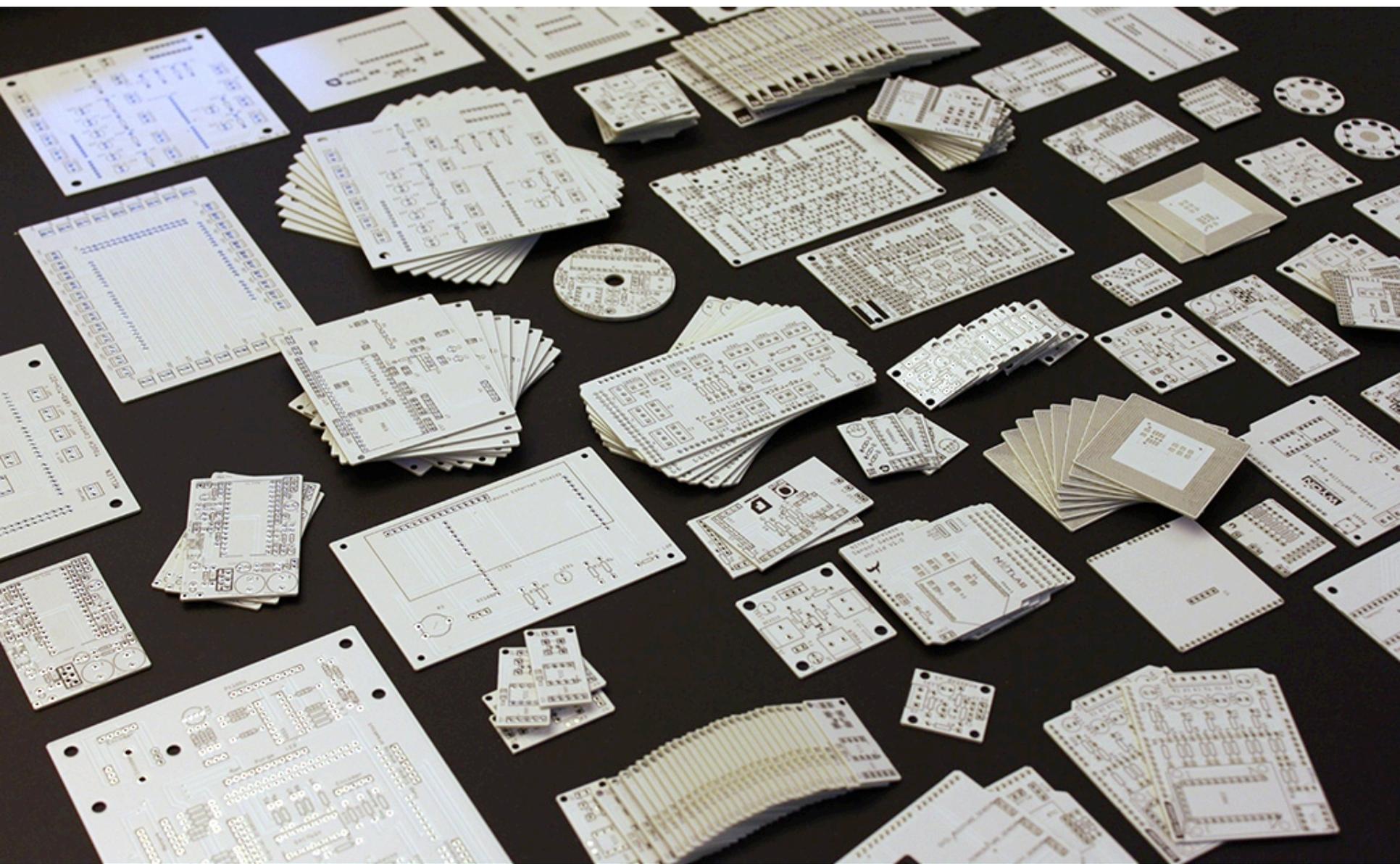
Workshops

fritzing



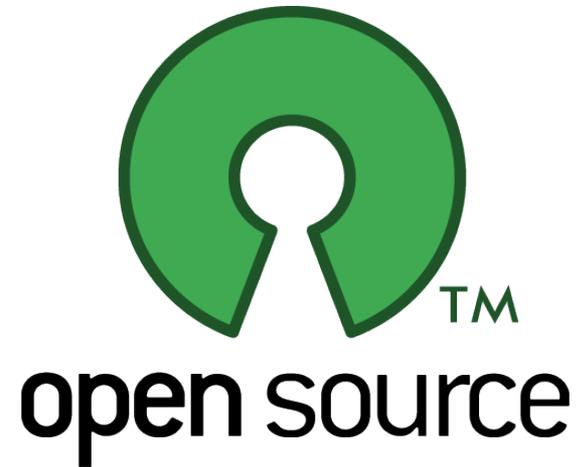
Fabrication Service

fritzing



Open-source for product

fritzing





How did it develop?

Research Grant

- ▶ FH Potsdam, Interaction Design Lab
- ▶ Funded 2007-2010 by MWFK Brandenburg
- ▶ Team of 5: 2.5 Designers + 2.5 Engineers
- ▶ Doing it for ourselves, with lots of enthusiasm

Idealistic Goals

fritzing

Co-Working

Free

DIY

Research

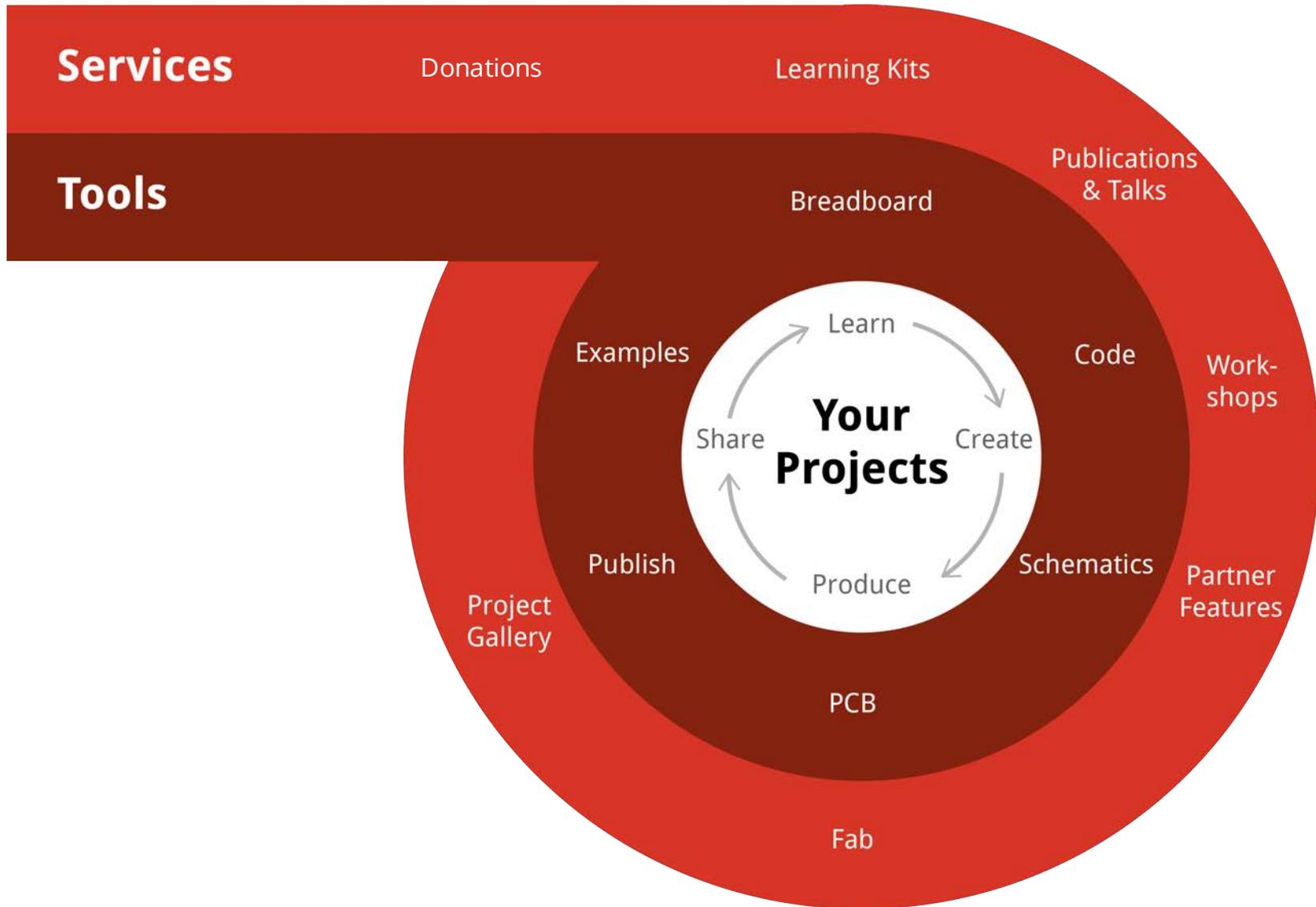
Open-Source

Prototyping

Community

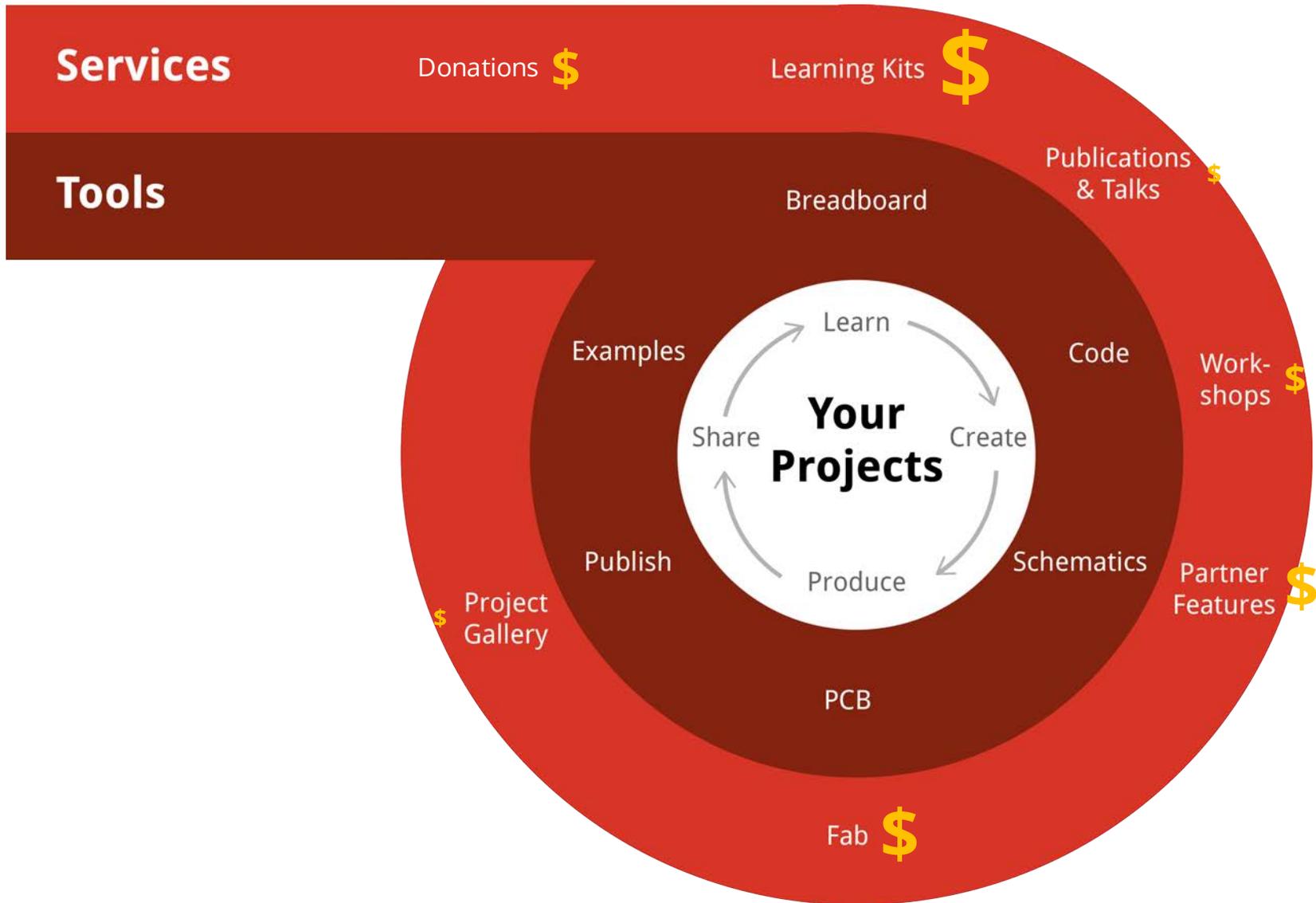
Ecosystem Idea

fritzing



Open-Source Economics

fritzing



Start-up economics

- ▶ Big Vision + Big Investment
- ▶ Crystal-clear Business Model
- ▶ Rapid Growth
- ▶ Intense Marketing
- ▶ Corporate Partnerships
- ▶ Professionalisation

Empowering education

Learning Goals

▶ Practical

- ▶ Basic electronic & programming skills

▶ Tactical

- ▶ You can do this yourself
- ▶ You don't need much besides dedication
- ▶ You can always find help
- ▶ Sharing is the key to self-educated learning

Not: Educational Resources

- ▶ „Learning materials“ are not sufficient
- ▶ Don't call it „learning“ or „education“
- ▶ Don't structure it too much
- ▶ Not skill-oriented, but results/project-oriented
- ▶ Provide a context that connects to people's life

- ▶ Give people a powerful tool, and they will learn
- ▶ Provide a broad range of examples
- ▶ Do not constrain, nor enforce a specific approach
- ▶ A „starter kit“ with everything to get going

Creativity as motivation

- ▶ Let people create something, anything really
- ▶ Encourage free-style learning
- ▶ Provide inspirations and provocations
- ▶ Offer practical, project/results-oriented tutorials
- ▶ Allow rapid iterations
- ▶ Let people re-invent the wheel

Community as breeding ground

- ▶ A tool quickly gathers a community of practice
- ▶ Sharing of examples is the best source of motivation and inspiration
- ▶ Promote copying from others

fritzing

Way to go!