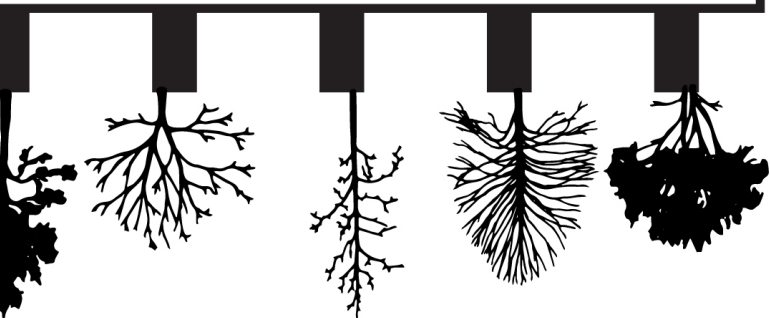
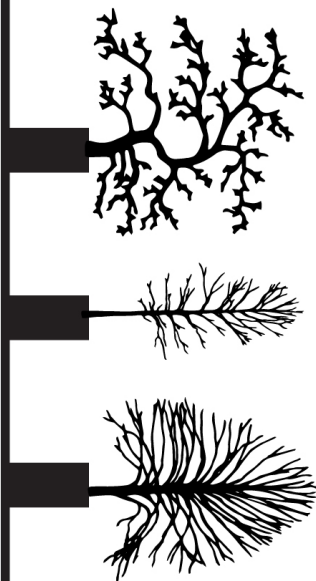


Least Likely Scenario part1

WORLD meets COMPUTER



welcome!

WORLD meets COMPUTER is a 2day workshop about the materials of electronics. how we can craft our own sensors and actuators, and program computers to read from these inputs and write to these outputs so that they can interact with us and our world.

this workshop is the first part of a course titled **Least Likely Scenario**. as courses go, this one is not so much a journey from A to B, but one that wanders a path in ways that invite you to get lost and be comfortable not always knowing where you are going.

in this part of the journey we will travel by means of re-making things differently in order to understand how things are made and to exercise our imaginations and hands.

while this style of travel may sound leisurely, don't be fooled. it is not as easy as it sounds to wander aimlessly in search of where your interests lie. documenting where you have been can help you maintain an overview. publishing your documentation becomes a means of sharing your knowledge with the world. what and how you choose to capture your process are also interesting things to consider.

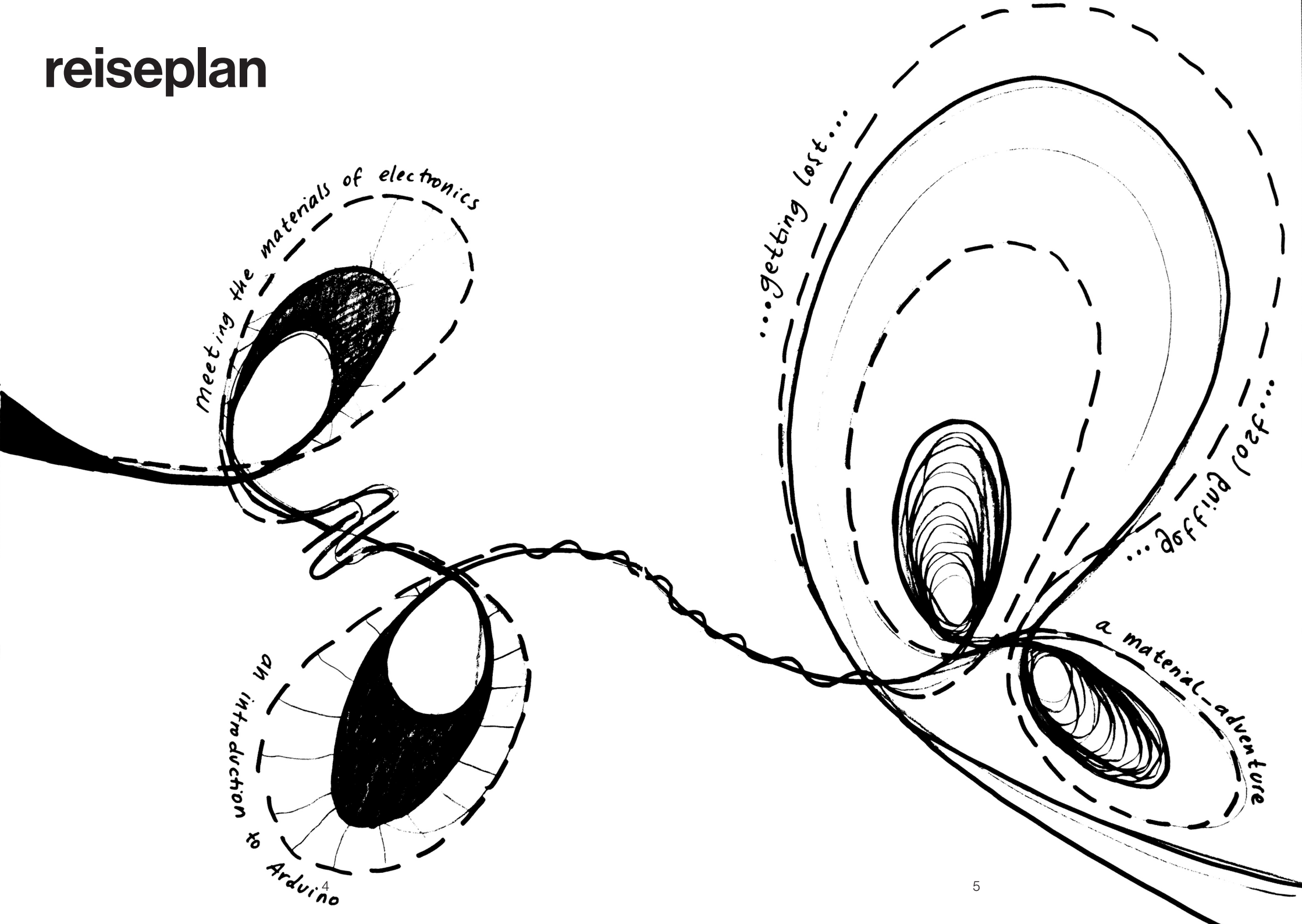
Least Likely Scenario

part1 ::: WORLD meets COMPUTER >>> 2day workshop

part2 ::: Material Adventures >>> 2day workshop

part3 ::: Least Likely Scenario >>> 5day projectweekz

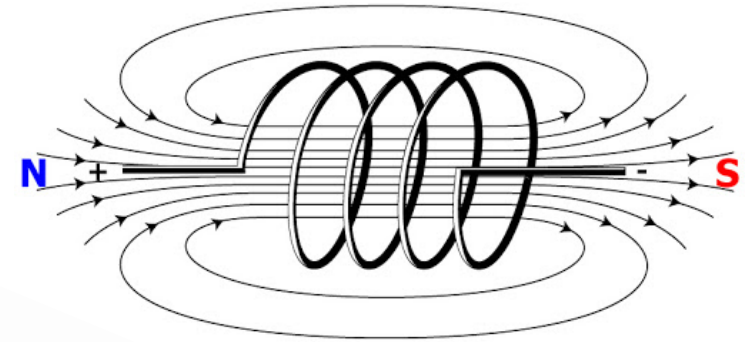
reiseplan



taking parts apart

a hands-on exercise in getting to know the electronic parts that make up the technologies we use every day.

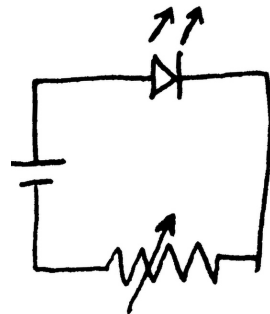
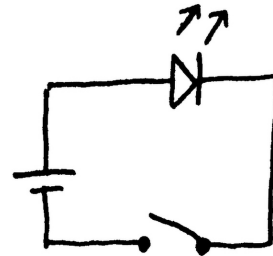
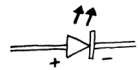
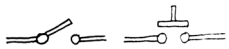
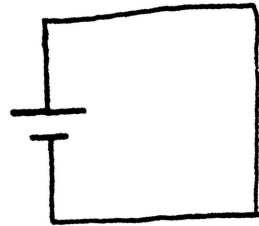
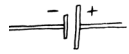
after understanding how they work, can we re-imagine them to be made in different ways?



electromagnetism

Elektromagnetismus, die Entstehung magnetischer Effekte infolge elektrischer Ströme. Bewegte elektrische Ladungen sind von magnetischen Feldern umgeben. Eine stromdurchflossene Spule besitzt ein Magnetfeld ähnlich einem Stabmagneten: Aus dem einen Ende treten magnetische Feldlinien aus und an dem anderen wieder ein, so daß die Enden der Spule den Polen eines Magneten entsprechen. Das Magnetfeld der Spule kann wesentlich verstärkt werden, wenn das Spuleninnere mit einem Ferromagnetikum ausgefüllt wird. Die im Ferromagnetikum auftretende Magnetisierung macht die Spule zu einem kräftigen Elektromagneten.

electronics



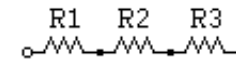
"Experimenting with a process and being open and not knowing what will come out in the end, is also a bit scary and it requires a lot of confidence. I not always have. Often the successes are really small but I even make a Freudenjump when a LED is lighting up. I like the LEDs. Because it can be a little light, but what happens in the background is that all the sensors get a different input on light, sound, vibration etc and I know, I am receiving them."
- Leoni Voegelin
(<https://spielundobjekt.de/2020/10/05/work-in-process-learning-to-listen/>)

resistance

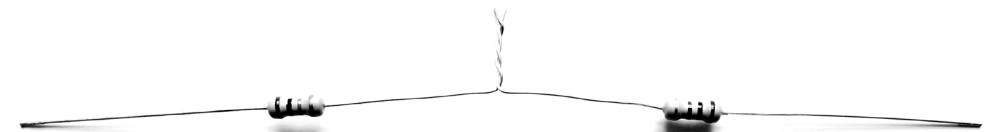


widerstand

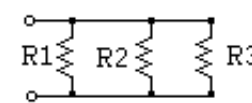
series



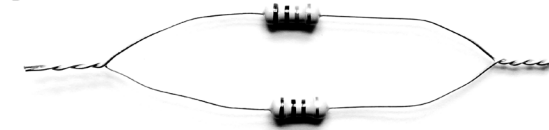
$$R_S = R_1 + R_2 + R_3$$



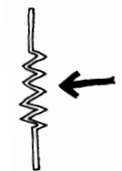
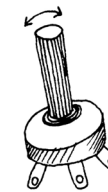
parallel



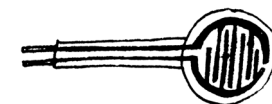
$$R_P = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$



potential dividers (potis)

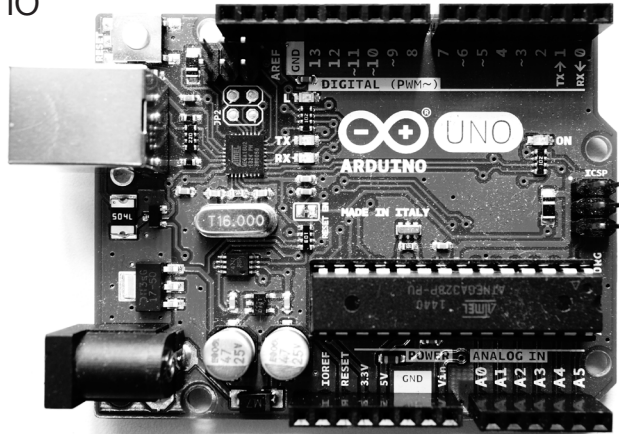


variable resistors (resistive sensors)

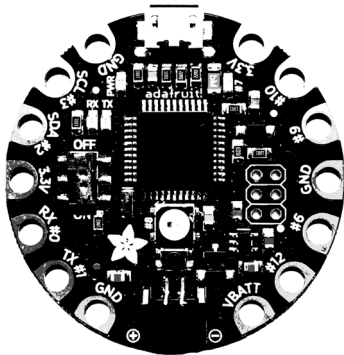


microcontroller programming

Arduino Uno



Flora v3



Arduino code

`void setup() { ... }`

The setup function is called when a sketch starts.
It will only run once after each powerup or reset of the Arduino board.

`void loop() { ... }`

loops consecutively, allowing your program to change and respond.

`Serial.begin(speed);`

Sets the data rate for serial data transmission.
speed: in bits per second (baud)

`Serial.print(val);`

Prints data to the serial port as human-readable ASCII text.
val: the value to print - any data type

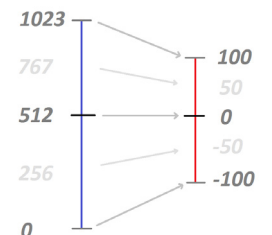
I/O	DIGITAL	ANALOG
READ	<code>digitalRead(pin);</code> returns: HIGH or LOW	<code>analogRead(pin);</code> returns: 10bit analog reading between 0 - 1023 (ADC resolution)
WRITE	<code>digitalWrite(pin, HIGH or LOW);</code> writes: HIGH (3V, 5V) or LOW (0V or GND)	<code>analogWrite(pin, [0-255]);</code> writes: 8bit PWM duty cycle between 0 (always off) - 255 (always on)

`constrain(x, a, b);`

Constrains a number to be within a range.
x: the number to constrain / a: the lower end of the range / b: the upper end of the range
returns: the constrained value

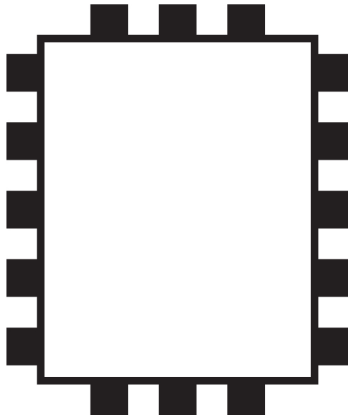
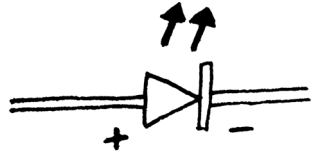
`map(value, fromLow, fromHigh, toLow, toHigh);`

Re-maps a number from one range to another.
value: the number to map
fromLow, fromHigh: the lower and upper bounds of the value's current range
toLow, toHigh: the lower and upper bounds of the value's target range
returns: the mapped value

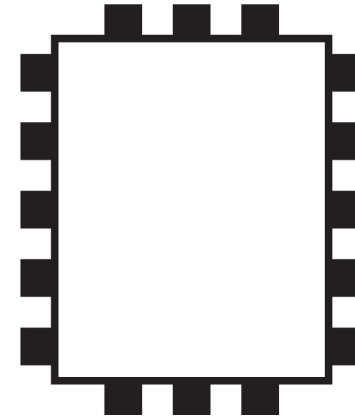
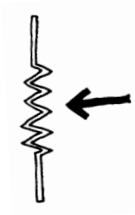


connecting.....

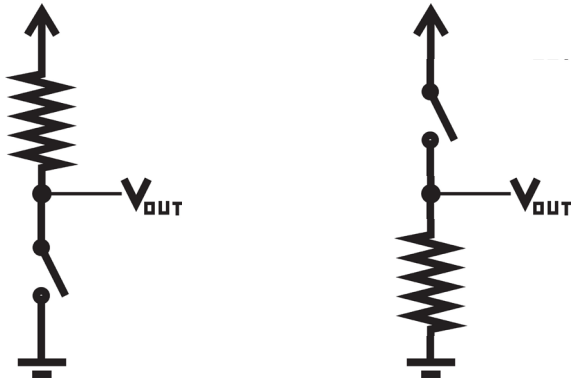
OUTPUTS



INPUTS

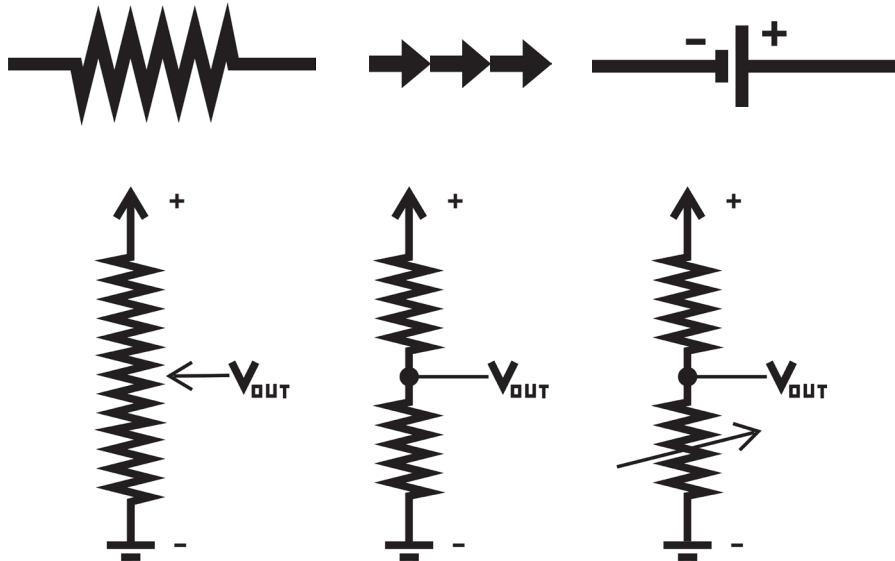


pull-up/down resistor



voltage divider

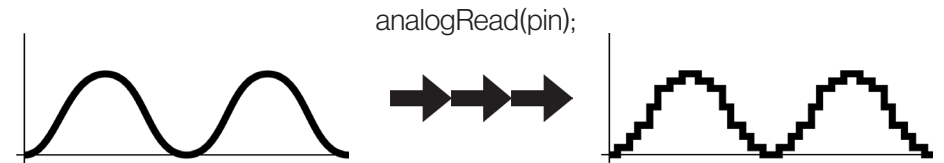
translating resistance to voltage



ADC

Analog Digital Converter

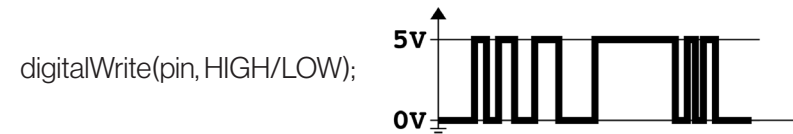
translating analog to digital



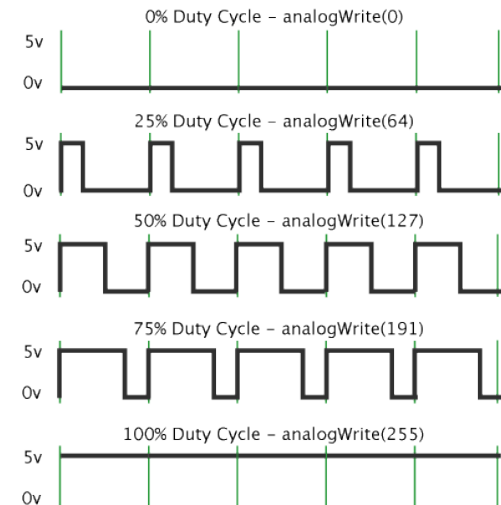
PWM

Pulse Width Modulation

translating digital to fake analog



`analogWrite(pin, 0-255);`



reading

Getting Started In Electronics

Forrest M. Mims

>> https://www.academia.edu/9885504/Getting_Started_In_Electronics_-_Forrest_M._Mims

There Are No Electrons: Electronics for Earthlings

Kenn Amdahl

"An off-beat introduction to the workings of electricity for people who wish Richard Brautigan and Kurt Vonnegut had teamed up to explain inductance and capacitance to them. Despite its title, it's not wild ranting pseudo-science to be dismissed by those with brains. Rather, Amdahl maintains that one need not understand quantum physics to grasp how electricity works in practical applications." (book review)

The Charge against Electricity

MIKE ANUSAS and TIM INGOLD

"Electricity has become such a ubiquitous feature of modern life that most of us would have no idea how to manage without it. Interruptions in supply are experienced as unsustainable moments of crisis. The possibility that the supply of electricity might eventually run dry is every government's worst nightmare and underpins the global politics of energy. Do we blame electricity for having brought us to this state of dependency? Can we hold it responsible for the disempowerment of citizens, for the entrapment of their lives within a state-sponsored grid maintained by corporations? Or does it, on the contrary, hold the potential for emancipation? Is electricity guilty or not guilty? In what follows, we begin with the case for the prosecution. Then we present the case for the defense. You, our readers, are the jury, and we leave the verdict for you to decide."

>> <https://journal.culanth.org/index.php/ca/article/view/ca30.4.03/200>

Push the Button

a poem by W. B. Nesbit

"If you have a lot of questions and are
worrying for answers,
Push the button.
If you want to know the ages of the youthful ballet dancers, Push the button.
If you want to know the reason for a vexing lot of things,
The worries of the commoners and discontent of kings,
And why you have to coax the youthful
wonder ere she sings,
Push the button."

Power Button: A History of Pleasure, Panic, and the Politics of Pushing

Rachel Plotnick

In a striking piece of writing long before computers, smart-phones, or "apps," Nesbit described a machine that could satisfy any want — one's "likings," "longings," and "joys," the status of one's relationship, as well as information on any topic — with the only requirement being that "you've got the strength to shove." [25] The **scenario** captured an already pervasive fixation with buttons, which glamorized a world where fingers operated effortlessly. In Nesbit's example, the push-button experience was totalizing and all encompassing, with one hand practice made to accommodate every need and whim.

This vision of a complete push-button existence wasn't always viewed positively, as in the case of E. M. Forster's dystopian short story, "The Machine Stops" (1909), where buttons could procure anything the protagonist desired, but the act of pushing would ultimately lead to the button pusher's severe and profound isolation:

There were buttons and switches everywhere — buttons to call for food for music, for clothing. There was the hot-bath button, by pressure of which a basin of (imitation) marble rose out of the floor, filled to the brim with a warm deodorized liquid. There was the cold-bath button. There was the button that produced literature. And there were of course the buttons by which she communicated with her friends. The room, though it contained nothing, was in touch with all that she cared for in the world. [26]

Rather than depicting an empowered consumer gratified by her consumption, Forster feared that this automatic living — push-button living — would alienate and disconnect a button pusher whose only ties to the rest of the world were buttons. Such a critique viewed long-distance, technologically enabled communication as a barrier to self-fulfillment rather than the hallmark of modern and efficient existence. Here, as with other concerns about distance and alienation, Forster proposed that being "in touch" via a push-button universe was not the same as the closeness of "human touch."

>> <http://rachelplotnick.com/power-button/>
excerpt >> <https://medium.com/@mitpress/pleasure-panic-and-the-politics-of-pushing-123b534e-ae7>

WS20/21
S&O
Hannah Perner-Wilson
spielundobjekt.de
howtogetwhatyouwant.at

