

Bizkaia Tech

Have you read the terms and conditions? | Issue 12



Bizkaia Tech



Who truly holds control? Is it the citizens who command technology, or is it technology that commands the citizens? Step into a realm where, as always, everything has its bright side and its... slightly darker one. Perhaps, you'll find your answer here.

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BizkaiaTech Passing Without Leaving a Trace

Issue 12 - Spring 25

Magazine

When we have answers we must change the questions. Only like this can we innovate disruptively. Changing schemes, paradigms and ways of thinking.

BizkaiaTech Magazine is a magazine about technology (with plenty of art) for inquisitive minds, full of good ideas, great projects and good vibes.

Born to share its knowledge, with a disseminating spirit and the soul of an artist.

With each change of season (winter, spring, summer and autumn) we get inspired, take a deep breath and capture it by launching a new issue.

We want to be the space where anyone, wherever they come from, can find the latest news in technology, great stories, projects that we are doing and that are to come and how to get the best out of our land, which belongs to everyone.

And all this, **collaborating with local artists.**

Editor Lantik S.A. (Sabino Arana Etorbidea, 44, 48012 Bilbao, Bizkaia) | **D.L.** LG BI 1461-2023

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REFLECTIONS

HAVE YOU READ THE TERMS AND CONDITIONS?

BY **BIZKAIATECH EDITORIAL TEAM** /
ILLUSTRATION **IÑAKI LANDA**

There is no consensus on where to situate the birth of the term "globalization." Linked to the economy, some argue that we can trace the origin and development of globalization back to the 16th century, at the dawn of the expeditions led from Europe, which marked the beginning of a globally connected economy.

What is clear is that, in the 21st century, new policies dominating media headlines in recent months are sparking a debate criticizing the downsides of globalization and advocating for new models that prioritize the local.

For our regular readers, you already know that part of the DNA of BizkaiaTech Magazine is deeply connected to technology, so we couldn't think of a better way to address this issue than through one concept: the idea of technological sovereignty.

To dig a little deeper, here's some context framed in the form of questions:

To what extent are we aware of the terms and conditions we accept when downloading and/or using a mobile app? Do we question the changes eventually made and the ways we use digital tools in our personal and professional environments? Are we even aware of the degree of imposition from tech giants regarding their technological products? Is there room for a different way of using technology?

TECHNOLOGICAL SOVEREIGNTY IN 3D

In the following pages, we will explore the concept of technological sovereignty through three dimensions: global, local, and personal.

The global dimension refers to the supremacy of Internet giants and their control over the technological tools that govern the world, with all that this implies: massive data control, significant influence on public opinion, and the emergence of a new economic landscape already referred to as neo-feudalism or techno-feudalism.

We will also map out the most cutting-edge, tech-based pilot projects emerging from public administrations funded by the European Union, developed on European soil by actors such as Lantik, the Technology and Innovation Society of the Government of Biscay and publisher of this magazine, advocating for technological sovereignty. To that end, we interviewed two prominent figures from GovTech4All, the European consortium coordinating these initiatives. You'll get first-hand insights into the projects being developed to improve and ease citizens' lives.

The local dimension relates to Bizkaia's ability to be technologically sovereign. Specifically, we will discuss the concept of the Basque fediverse; the group Abaraska will explain it in full detail: a set of platforms and services within the fediverse that operate in Basque or are aimed at the Basque community. The fediverse is a network of interconnected servers hosting different social communication platforms, all based on free software and open protocols, allowing interaction across different services in a federated and decentralized way.

The personal dimension calls for individual responsibility concerning technological sovereignty. You'll enjoy a tutorial introducing the "maker culture" concept, closely tied to the main theme of this issue, showing you how to build a homemade, open-source video game console from scratch using a Raspberry Pi. We also asked one of our writers to share a story about what it's like to spend a day without using GAFAM (an acronym for Google, Apple, Facebook, Amazon, and Microsoft). Spoiler alert: yes, it is possible.

ENJOY YOUR READING!

SOUL TECH

From Network Society to Digital Labyrinth: Algorithms, Bubbles, and Attention Markets

BY IÑIGO GALZACORTA (UPV/EHU) / ILLUSTRATION JULIA GRIS

Those of us who were young in the 1990s still remember the enthusiasm with which the arrival of the Internet was received.

Suddenly, a new space of freedom opened before our eyes, a digital territory where information would flow horizontally and globally, bypassing the mediation and censorship of the powerful groups that at the time controlled the media shaping the public sphere. It was as if, overnight, a crack had appeared in the wall of one-way communication: forums like The Well,

homemade pages like Geocities, or collaborative projects like Wikipedia embodied the promise of a “network society,” where knowledge and public discussion could circulate freely and without hierarchy,

weaving collaborative networks that would challenge the vertical structures of the past.



Today, three decades later, that crack of hope has turned into a labyrinth whose walls are constantly redesigned by invisible architects. The image of the “network society” no longer evokes a world of freedom and horizontal communication but rather a mesh that entangles us, guiding our interactions, access to information, and even our tastes and desires.

The promise of reticular freedom has mutated into an effective regime of surveillance, where sophisticated algorithms, new instruments of control disguised as technical neutrality, decide what we see and what we think, turning the traces of our online lives into the engine of a new global economic model.

TECHNOLOGIES OF RELEVANCE

Establishing a criterion to sort and select information has been a constant challenge throughout the history of civilization. Libraries, catalogs, encyclopedias, as well as various academic and publishing projects, illustrate how each era has faced the growing mismatch between stored information and the human capacity to assimilate it.

Google became the arbiter of public truth, a role once held by editorial or academic institutions

1998 was a decisive year in this history. That's when Google, a company destined to transform the world we had known until then, emerged. At a time when the exponential growth of the World Wide Web was making search engines like Yahoo! or Altavista obsolete — still relying on traditional classification methods — Google's PageRank algorithm dazzled those of us who were then intuitively navigating a sea of irrelevant links with its simplicity and effectiveness. But Google's surprise was not only its power to bring order to the chaos the web was becoming. While its rivals overwhelmed our screens with invasive ads, Google offered a clean, minimalist design: a white canvas topped by a simple logo and a search bar. This almost ascetic simplicity was disconcerting: what was the business model behind this seemingly selfless tool? The answer lay in the invisible. We suspected that its control over the information — deciding what we saw in each search — gave it unprecedented power. What we didn't yet know was that the real treasure wasn't in the information it offered us — but in the data we were giving it.



GOOGLE AS MODEL: ALGORITHMS AND THE COMMODIFICATION OF ATTENTION

Who could have guessed that behind that clean and seemingly transparent page was the secret machinery of the world to come? Google's power — destined to transform how the web worked — lay in a sinister intersection of two data flows: on the one hand, it offered us order and relevance, selecting the information worth seeing; on the other, it extracted and archived every trace of our digital activity, turning it into a new source of value. This dual movement is the hidden core of life online.

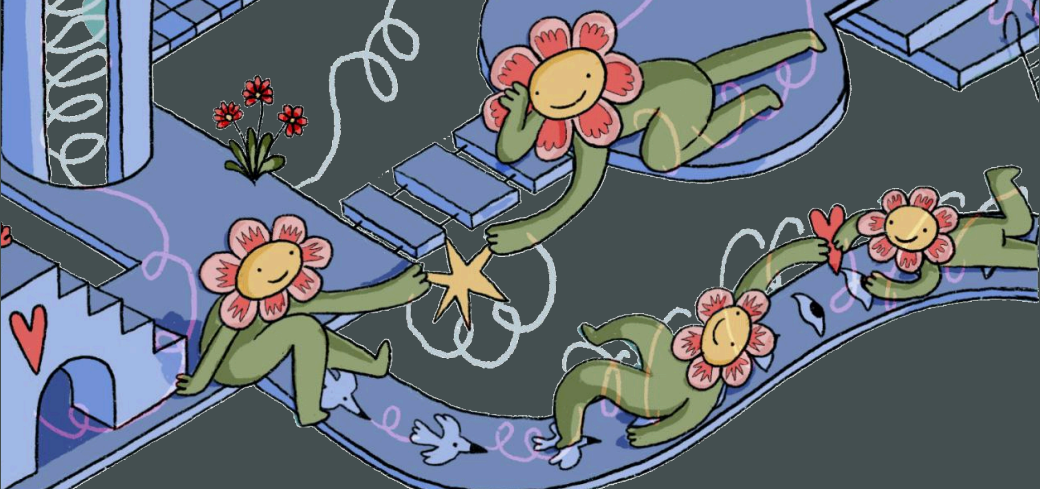
Google taught us the power of the algorithm, a term vaguely remembered by humanities students from math classes but which would become crucial for understanding the society and politics of the years ahead. The PageRank algorithm didn't just organize chaos on the web, it defined what was worth seeing and what should be buried. By deciding “relevance,” Google became the arbiter of public truth, a role once held by editorial or academic institutions. Unlike those, its criteria were not human or debatable, but a mathematical code presented as neutral and objective. PageRank was just the beginning: soon, algorithms would govern not only our searches but also our social relationships (Facebook), music preferences (Spotify), romantic connections (Tinder), and political opinions (Twitter).

At the same time, the web became a massive data-extraction mechanism. Every search, like, or two-second pause became a valuable commodity in what Shoshana Zuboff has called the “behavioral futures markets.” Platforms like Google or Facebook predict and shape our behavior, selling that information to the highest bidder. This economic model, based on attention as a finite resource, has concentrated talent and resources around a single goal: keeping us glued to our screens. Designers, psychologists, and engineers work to perfect the mechanisms that turn our curiosity into attention. Thus, while we think we freely navigate the web, we are actually feeding the machines that control us. The intersection of these two forces — the power to dictate what information is relevant and the conversion of our digital lives into commodities — has defined the contemporary world.

THE AGE OF PERSONALIZATION: FROM GLOBAL VILLAGE TO DIGITAL TRIBALISM

2009 was another turning point. That year, Google announced a major update to its relevance algorithms. From then on, our browsing data would not only feed the markets where companies and political parties bought predictions about our habits, but also — as they claimed — “improve user experience.” The promise was seductive: results would no longer be universal but personalized. Relevance ceased to be an abstract and general concept and became something individual and tailored to each user. Just like that, the age of personalization began.

Behind this apparent concession was a perfect trap, consolidating the fusion between the two flows: content selection and data extraction were now one and the same. Personalization was not neutral, it prioritized content that maximized screen time, turning “relevance” into a tool of the attention economy. Platforms like YouTube and Facebook perfected the art of “addictive relevance”: algorithms prioritizing content capable of keeping us glued to the screen, even if that meant promoting conspiracy theories, hate speech, or fake news. Truth or public interest were no longer decisive criteria, what was “relevant” was whatever held our attention long enough to generate more data for sale.



THE STRUGGLE FOR THE COMMONS IN A DIGITAL WORLD

Our time is marked by a singular situation. We live at the intersection of two profit-extraction modes: the industrial, which leaves a toxic legacy on our planet, and the digital, which undermines our capacity to respond to it. To confront the ecological crisis, we need shared facts, trust in science, and coordinated global action; but 21st-century capitalism turns the public sphere into a fragmented battlefield. Algorithms that govern the web, designed to monetize every second of attention, prioritize outrage over dialogue, the quick click over reflective thought.

Truth or public interest were no longer decisive criteria, what was “relevant” was whatever held our attention long enough to generate more data for sale

Life online is defined by unprecedented asymmetry. The mechanisms behind the screen know nearly everything about our lives, while we know almost nothing about how they function. Digital corporations track our sleep patterns, political fears, and shopping habits, but their algorithms, the rules shaping our online lives, operate in opacity. Disguised as efficient and neutral tools, they are in fact architectures of power that decide what ideas circulate, what voices are amplified or silenced, and what communities form or dissolve. It may seem difficult to imagine a way out of this crossroads between socio-ecological crisis and digital labyrinth. But if a way out exists, we know it will require a technological enlightenment. We must understand that code and algorithms are not merely technical tools — they are political systems that structure society. Enlightenment in the 21st century means demanding transparency in the design of networks, democratizing their control, and transforming “digital education” from a pretext for handing over classrooms to big tech into a space for critical resistance. This is not about rejecting technology, but about taking it back from those who use it to fracture what we hold in common. And for that, the first step is to show how behind the apparent neutrality of technical efficiency lies a set of political decisions that decisively shape our way of being in the world.

This is not about rejecting technology, but about taking it back from those who use it to fracture what we hold in common

PURE TECH

FROM THE CASTLE TO THE ALGORITHM

BY BIZKAIATECH EDITORIAL TEAM /

ILLUSTRATION JON ANDER



Technofeudalism (Varoufakis, Y. 2024, *Technofeudalism: The Stealthy Successor to Capitalism*) is a term coined by Yanis Varoufakis, the former Greek Minister of Finance in 2015 and a renowned thinker. According to Varoufakis, this trend has buried capitalism. A new reality has emerged in which a few giant companies (like Amazon, Google, Facebook, Apple) no longer compete against each other in open markets, as was supposed to happen under classical capitalism. Instead, they own digital "fiefs."

JUST LIKE IN MEDIEVAL FEUDALISM, THERE ARE FEUDAL LORDS, VASSALS, AND SERFS

Google, Facebook, Apple) no longer compete against each other in open markets, as was supposed to happen under classical capitalism. Instead, they own digital "fiefs."

These so-called "lords of the air" (Echevarría, J. 1999, *Lords of the Air*), rather than selling products in a free market, control the spaces where we work, shop, socialize, and play (such as Instagram, YouTube, or app stores). These spaces are not true markets; they are closed platforms governed by rules designed around their own interests.

Just like in medieval feudalism, there are feudal lords (the owners of the platforms), vassals (small businesses that depend on platforms like Amazon), and serfs (those of us who use and feed these platforms).

This new digital order not only transforms the economy, but also the way we interact, work, and access information. Platforms, by controlling data, algorithms, and digital infrastructures, shape our decisions, preferences, and behaviors. Thus, power no longer lies primarily in the ownership of factories or natural resources, but in the control of information and access to digital environments. This grants the "lords of the air" an unprecedented level of influence in recent history.

Here's a more schematic comparison to help you better understand this concept:

FEUDALISM THE MIDDLE AGES

ECONOMIC BASIS

Agriculture and land ownership.

SOCIAL RELATIONS

Feudal lords dominate the peasant serfs.

PRODUCTION

Agricultural labor for subsistence, with part of the production given to the lord.

SOURCE OF POWER

Territorial and military control over large areas of land.

MARKETS

They're not very important; almost all production is for self-consumption.

TECHNOLOGY

Very limited; advances are slow (e.g., the plow, the water mill).

CIRCULATION OF WEALTH

It is stagnant; wealth does not circulate much and is concentrated

INDIVIDUAL AUTONOMY

Very low; serfs are tied to the land and have no social mobility.

FORM OF EXTRACTION

There are personal obligations (labor, goods) owed to the feudal lord.

TECHNOFEUDALISM ACCORDING TO VAROUFAKIS

Ownership of digital platforms (what is referred to as cloud capital).

Platform owners dominate users and connected workers.

Digital labor (data, content, interactions) that generates value for the platforms.

Control over digital networks, data, and online access.

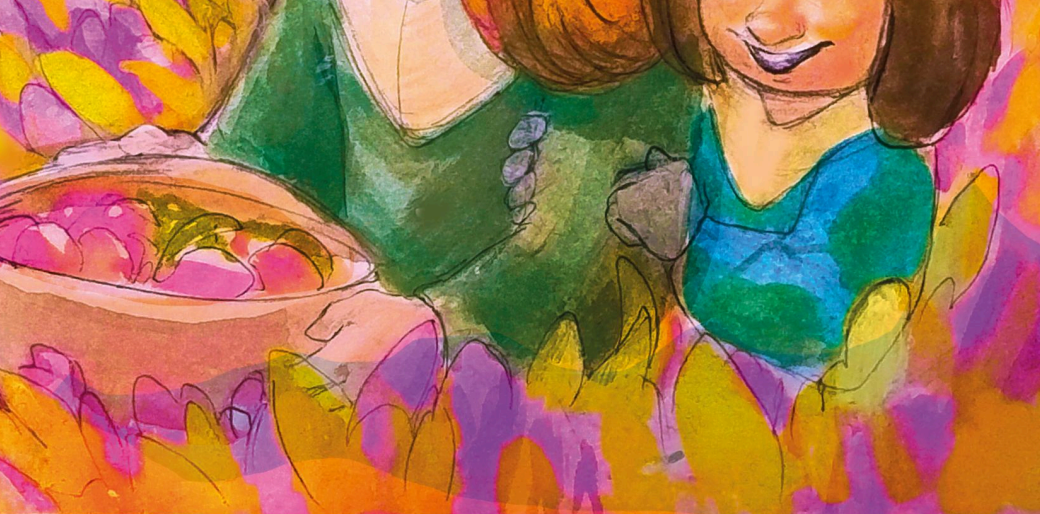
They are simulated; in reality, platforms operate as closed fiefs (e.g., giants like Amazon or Apple).

Highly advanced; AI, big data, cloud servers.

Very high for the "owners of the cloud"; precarious for the majority.

Also low; we depend on platforms for work, shopping, and socializing.

Digital rent (access to the cloud, commissions, algorithms that capture attention and unpaid labor).

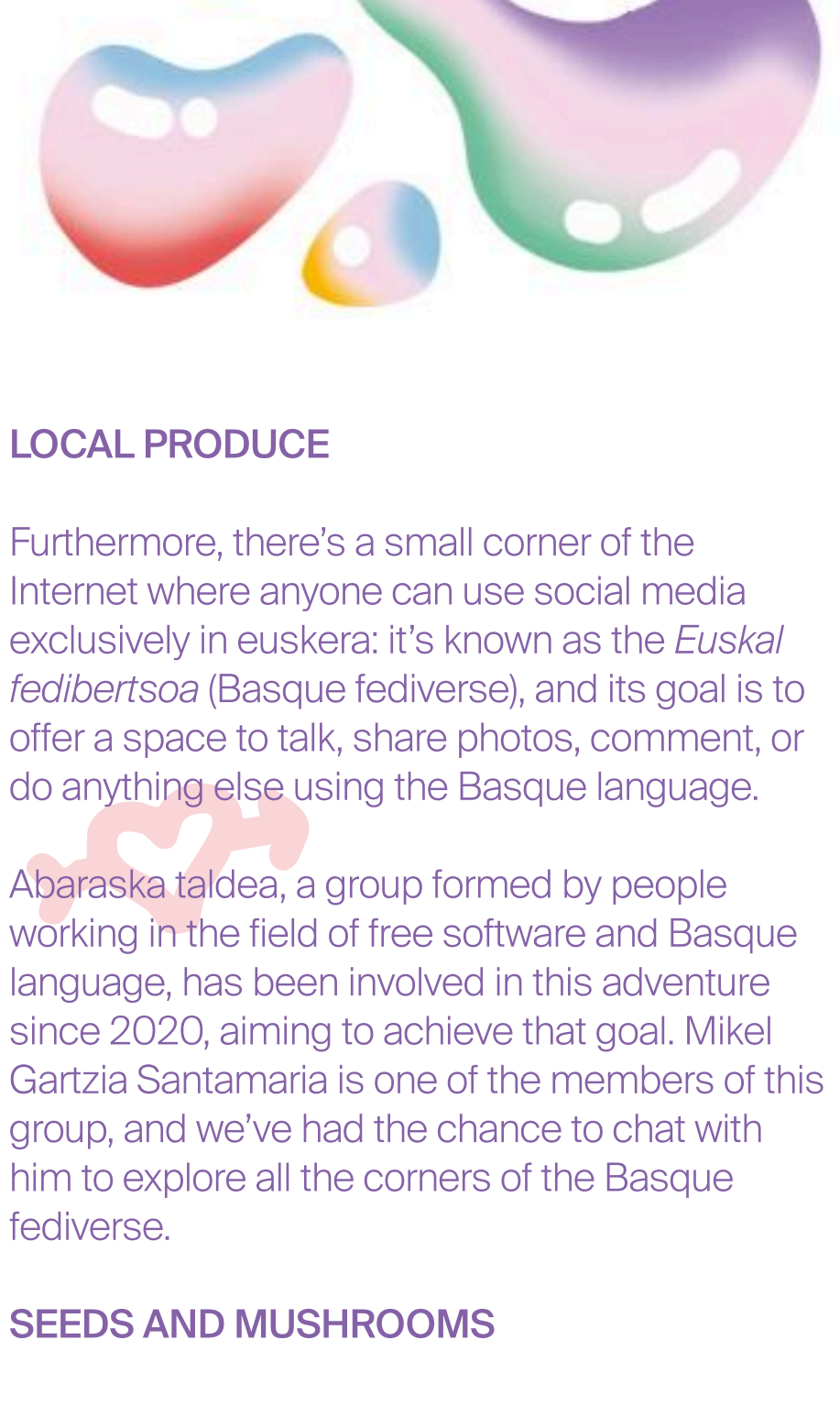


SOUL TECH

Our Network, Our Rules

BY BIZKAIATECH EDITORIAL TEAM /
ILLUSTRATION GORKA GIL

When we use social media, we somehow know that we're making a pact with the devil. Elon Musk, Mark Zuckerberg, Jeff Bezos, and other technocrats use our data and the information we've given them for free to fatten their wallets even more, but we don't care. As long as we can spend hours scrolling on Instagram... it's all good. However, there is a way to use social networks in a decentralized and interconnected way, a way where we wouldn't have to make a pact with the devil; yes, you guessed it: the fediverse.



LOCAL PRODUCE

Furthermore, there's a small corner of the Internet where anyone can use social media exclusively in euskera: it's known as the *Euska! fedibertsoa* (Basque fediverse), and its goal is to offer a space to talk, share photos, comment, or do anything else using the Basque language.

Abaraska taldea, a group formed by people working in the field of free software and Basque language, has been involved in this adventure since 2020, aiming to achieve that goal. Mikel Gartzia Santamaria is one of the members of this group, and we've had the chance to chat with him to explore all the corners of the Basque fediverse.

SEEDS AND MUSHROOMS

As Mikel says, "mushrooms don't grow out of nowhere," and Abaraska taldea, in the same way, didn't arise from nothing. It was the group called Librezale who planted the seed for all of this. The people in that group, who were mainly focused on translating software into Basque, decided they wanted a small part of the fediverse to belong to Basque speakers, and from there, they formed a small group that would later become Abaraska taldea. From the beginning, their goal was to create a safe and welcoming space for the Basque community.

Their first step was through the social network Lemmy. This network includes forums, and it's meant to be a substitute for the well-known page Reddit. However, according to Mikel, forums are not very common among the Basque community, so the page Lemmy.eus wasn't very successful. Later, they helped support the page Pixelfed.eus, since its creator, Urtzi Odriozola, contacted Abaraska to give a boost to the node he had created. Eventually, he also became a member of Abaraska taldea. The next step was the launch of the portal Peertube.eus, the equivalent of YouTube, and finally, the publication of the page Paperjale.eus, a small Internet corner to talk about books in Basque.

"Each person needs to find the Internet that aligns with their values"

As Mikel says, "since it can be a bit confusing for newcomers," all the options to enjoy the Basque fediverse can be found on Fedibertsoa.eus, not just the platforms managed by Abaraska, but all the ones available. And note: it's always up to date!

WHAT MAKES US SOVEREIGN?

Technological sovereignty is a topic more and more people are talking about. Making a deal with the devil is becoming less and less amusing to people, and society, even if habits are hard to change, is becoming aware of what's happening around it. Will changing attitudes and habits make us sovereign? Will leaving behind our usual social networks and moving to the Basque fediverse make us sovereign?

Well, it might be a way to start the path toward technological sovereignty. According to Mikel, being part of the fediverse can help achieve this in two ways: On one hand, the software is open source and free to use (although Abaraska taldea donates to the developers to help them improve the software), and anyone can access or create their own platforms. When the software is closed, the code is controlled by a company that sets its own rules, eliminating transparency with the user. Also, these centralized networks often begin to undergo the process of enshittification once users are hooked. This peculiar-sounding term (you're likely to remember it) describes the decline of a platform, that is, the reduction in the quality of service or the need to pay for the same or even worse service. All this increases the opacity of these platforms, and the user has no idea where their data is going or who is getting their money, among other concerns. Therefore, open source software is much more transparent.

On the other hand, Mikel points out that Abaraska does not use VPS or private servers (hardware). Contributing money from their own pockets and with help from their subscribers, they bought a server located in Zumaia, which backs up to a server in Saint-Jean-de-Luz. So, physically, the responsibility for storing this data lies with them. Mikel says that although the server gives them many tasks and worries, it also gives them a high degree of sovereignty, which is, ultimately, what they value the most.

Although Abaraska taldea does it this way, individuals could also install hardware at home, for example, using a Raspberry Pi.

Mikel believes that, in these cases, what matters most is that the people behind the hardware, have real names and surnames.

A LEARNING PROCESS

Back to the mushroom metaphor: it's impossible to achieve technological sovereignty overnight. Nor can we suddenly change the habits and routines we've internalized for years. We talked with Mikel about the waves of social media migration caused by Elon Musk's actions, and he says there have already been a couple of so-called "Elon waves." During those waves, people usually come over to say hi on different fediverse platforms, but many of them don't stick around. Hey, everyone has their reasons, and we must respect individual rhythms.

According to Mikel, to really stay, people need to make two or three attempts at this world, but often, people aren't willing to make that effort. And even if they do, sometimes their friends are left behind, and using multiple platforms becomes a burden...

Still, Mikel is happy with these approaches. In his opinion, this is just a starting point, and he's sure of one thing: "this is here to stay, so we're not in a hurry. But we can't allow this sovereign corner to become a niche only for tech enthusiasts. The goal we need to set as a collective is for everyday people to normalize and use these platforms." For the Basque fediverse to remain alive, it's important that more people join the cause, but something even more important is keeping the instances that make up the fediverse alive and active, something Abaraska taldea is doing.

So, go ahead and try out this special and fascinating way of navigating the Internet. Even if that first "hello" feels a bit strange, don't stop yourself from giving it a second or third chance, you might just discover your new favorite corner of the Internet. As Mikel says, "each person needs to find the Internet that aligns with their values." Amen.

SOUL TECH

WILL THE MACHINE GOVERN US?

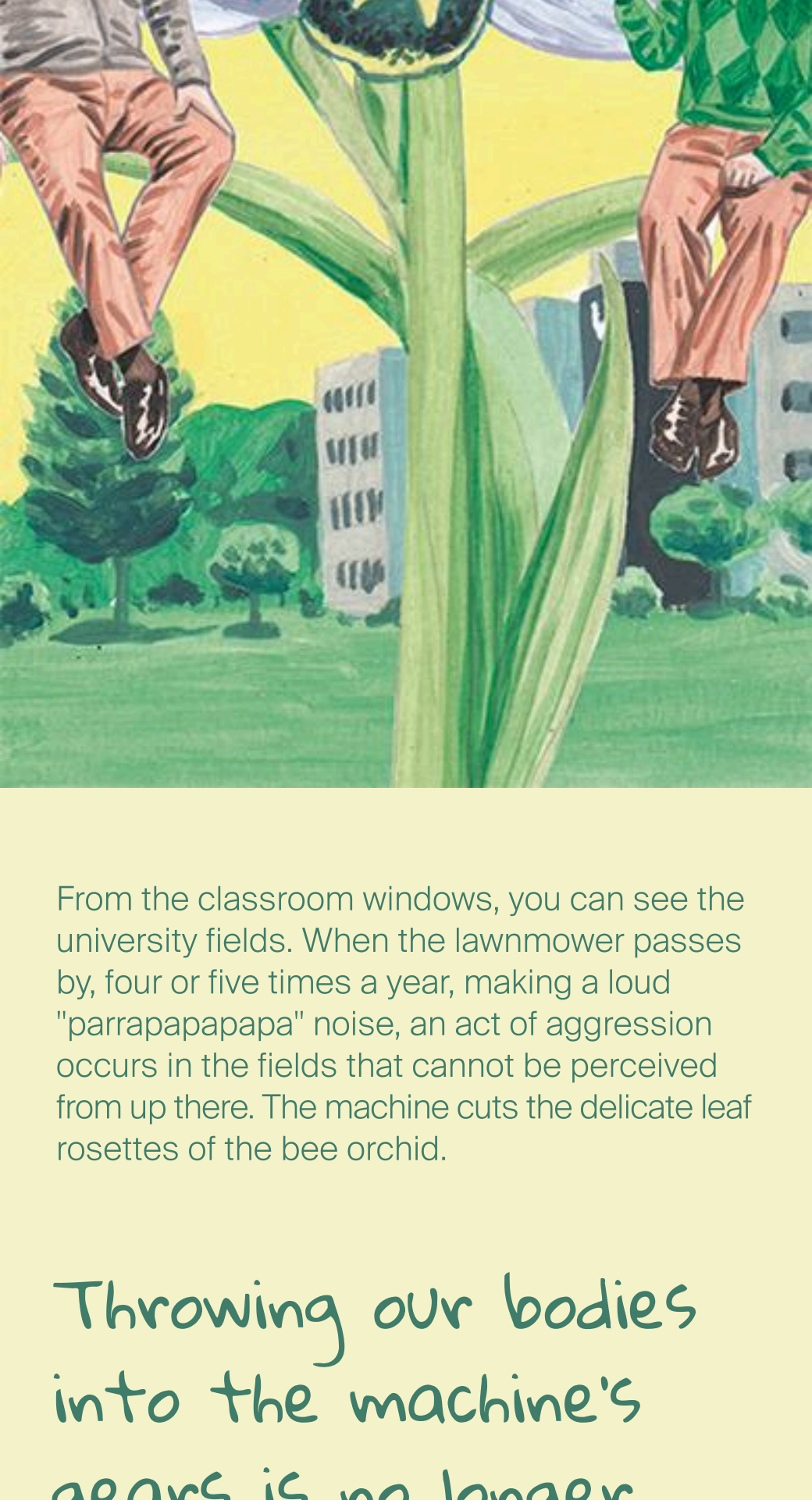
BY **EKAI TXAPARTEGI (UPV/EHU)** /

ILLUSTRATION **PABLO GALLO**

Some sticks with little red flags have appeared in the fields of the university.

They are the resistance, life resisting against the machine. If you think about it, it's another lost battle. Seen from an office, it's just two retirees being a nuisance.

A snapshot of the moment, if we reflect from a philosophical perspective.



From the classroom windows, you can see the university fields. When the lawnmower passes by, four or five times a year, making a loud "parrapapapapa" noise, an act of aggression occurs in the fields that cannot be perceived from up there. The machine cuts the delicate leaf rosettes of the bee orchid.

Throwing our bodies into the machine's gears is no longer a realistic option

After several attacks over the years, the bee orchid has built an astonishing shield: two retirees. They are ecologists, and they mark the plants (*Ophrys apifera*) with long sticks so they won't be cut down.

The bee orchid is a wild orchid, a rare remnant of the surrounding flora that blooms now, from April to July. If left to grow, it disguises itself as a bee to attract real bees and thus pollinate itself. The relationship between the plant and the bee is highly sophisticated, of great interest from a biological perspective. A plant and a bee, nature deceiving nature, nature putting nature to work. This wisdom, millions of years old, is rooted in the university fields, but the subcontracted gardening company cuts and punishes the bee orchids. Of course, the gardeners have nothing against these plants. Since they must keep the fields tidy and the budget is tight, they do what is cheaper and quicker, exactly as society dictates.

The two retirees plant long sticks in the field. They are visible to everyone, marked with red ribbons. Even so, when I asked around, few people said they had noticed them, because we don't see what we don't understand. The people that walk around the University still don't realize that these sticks are there to hinder the machine. Some call it a "fight." To me, it feels more like poetry, because of the metaphorical and evocative power of pointing out the flowers with sticks to protect them from machines.

BODIES IN THE GEARS

In this sense, I especially remember one painful experience I had at the University of Berkeley in California: the moment when the iconic "anti-machine" café lost its way. Student activist Mario Savio, in his memorable speech on December 2, 1964, surrounded by university students, shouted from the plaza in front of the café:

"There is a time when the operation of the machine becomes so odious, makes you so sick at heart, that you can't take part! You can't even passively take part! And you've got to put your bodies upon the gears and upon the wheels, upon the levers, upon all the apparatus, and you've got to make it stop!"

Sixty years later, right there, a poorly-paid, unaware student-worker served me machine-made coffee in a plastic cup. It made me incredibly angry. Those sacred words deserve better. How could they allow a coffee machine to take over that sacred place? I can't think of a more effective way to trample the anti-machine movement than putting it at the service of a coffee machine.

In that university field, Savio represented himself as a bee orchid, subjected to the machine. He gave his speech a Luddite tone: we are people, we are against the machines! Even so, if we interpret him correctly, his criticism wasn't against "technology" itself but against authoritarian capitalism. Metaphorically, he called authoritarian capitalism "the machine." The students of the 1960s mobilized against autocracy, against the transformation of the university into a business, and against bureaucratization, commodification, and the violation of rights. The machine was the authoritarian logic that determined everything.

Sixty years have passed since then, and the machine still mows the grass cheaply and quickly to keep our fields tidy. Sixty years have passed, and in all this time, authoritarian capitalism has evolved into technological neoliberalism, driven by the need to do everything cheaper and faster.

TECHNOLOGICAL REPUBLIC

Alex Karp, owner of the tech company Palantir and an icon of technological neoliberalism, believes in technological determinism: Technology moves forward and drags people behind it. They use something like a motto: technology doesn't kill; not adapting to technology kills. This is the new technocratic movement: the "tech bros," almost all men, billionaires, and even more radical than the technocrats of the 20th century: adapt (to technology) or die.

What they support is a technological republic, not a democratic republic

The evolution of technological development has changed how we understand technocracy. Nowadays, the 19th and 20th-century technocracy criticized by Weber and Habermas seems almost quaint: turning political decisions into 'technical' ones, the state administration making all important decisions without leaving real political options to the citizens. Politics becomes a show, and democracy a mere legitimizing mechanism. Today, that old bureaucratic technocracy would almost be comforting.

These new liberal technocrats have arrived after that 'classic' technocratization of liberal democracies. They are scarier; they want revenge. Ideologically, they are libertarians, embracing "solutionism" and hard power, believing that technology can solve even the toughest problems. Once they got the keys to the White House, they immediately began replacing government agency staff with software. Elon Musk's "Department of Government Efficiency" (DOGE) is an example. From the traditional Government-Company technocratic model, we have moved to the Government Machine model, where all government decisions are automated through artificial intelligence and the streamlining of the most advanced software. Machines will decide what to do in every field because they know more than people, because they think better than people. It's the most efficient way.

To understand this kind of extreme technocracy, Alex Karp's book *Technological Republic* is very enlightening. Karp accuses Silicon Valley of using its privileged location to develop frivolous devices and apps, like Zynga games or Groupon coupons, weakening Western states and society at large. He even says empathy has weakened the West, with a brutal honesty. He calls for facing this weakening trend by combining technology with hard power: "Our technology is for protecting countries and killing people," he stated recently in an interview. The gigantic machines they design dream of governing society in the name of maximum efficiency, the only way to compete with China's machinery and maintain Western supremacy.

BODIES IN THE GEARS OR GEARS IN THE BODY

Mario Savio or Alex Karp? Throwing our bodies into the machine's gears is no longer a realistic option. It wasn't back in Savio's day, and it's even less so now, when the gears are so deeply integrated into our bodies. However, giving political agency to the machine, as Karp proposes, is democratic suicide. Karp wants to technologize government: "AI-powered automation for every decision," so that states have to buy Palantir's software, as these companies live off public money. They want the biggest defense contracts from the U.S. Department of Defense to stay on top of the world. They are techno-oligarchs; they have no interest in democracy. What they support is a technological republic, not a democratic republic.

For or against technology? It's as foolish to prejudge the question morally as it is to ignore the political and economic dimensions involved. The key is to change the questions: What do we want? What are our interests?

HUMANS HAVE NOT YET INVENTED A TECHNOLOGY MORE ADVANCED THAN THE BEE ORCHID

In Karp's technological republic, there are no Basque people, because in his ideology of maximum efficiency, the Euskal Herria project and the effort to revive the Basque language cannot be justified. Technological choices are not neutral. The enormous political and economic consequences of technological opportunities show us that in these opportunities, we are gambling with our future, our freedom, our democracy, and the well-being of our people.

Soon, the lawnmower won't even need a gardener to do its job. Will this be positive for those of us who are bee orchids? Will big data decide whether protecting bee orchids is worth the effort? And if so, what will it decide? It will depend on the technological decisions we make. Otherwise, those of us who are orchids will have to start looking for our own retirees.



STRAMBOTIK

AGUR, GAFAM

BY **BIZKAIATECH EDITORIAL TEAM** /ILLUSTRATION **LAURA BARQUÍN**

As soon as I open one eye after waking up, I realize I have a massive hangover. What time is it? Crap, I remember I made brunch plans with my friends at 11, did I oversleep?



I roll around in bed to find my iPhone, it's on the nightstand. For some reason, it's not working. Just what I needed. Maybe the battery's dead... Nope, even plugged in, it's not working. Great. I don't even remember hitting it while partying, but to be honest, I hardly remember anything from last night.

But all is not lost: I've got my laptop in the drawer. With another big stretch, I can reach it. Hey, that's not working either! What's going on?

I get out of bed, dizzy, but I get up. I go check if the TV works because I still have no clue what time it is. I don't even have a darn clock in the house, I should order one from Amazon. Okay, the TV works, thank goodness. And it's 2 in the afternoon! Between that and my phone not working, brunch is ancient history. Since I've got nothing else to do, I leave the TV on, which I haven't done in a long time. It's news hour, and every channel is broadcasting the same story:

"What happened to GAFAM?"

"A World Without GAFAM"

"All About the Fall of GAFAM"



I have no idea what GAFAM means, and I remembered I couldn't Google it the second I reached for a phone that wasn't there. Luckily, África Baeta explained it in a flash:

— If you woke up this morning and couldn't use your Apple devices, your Amazon order didn't arrive, or you couldn't do a Google search, don't worry; you're not the problem. GAFAM, an acronym made up of the tech giants Google, Apple, Facebook, Amazon, and Microsoft, has been hit by an unprecedented virus that has shut down systems across the world.

Phew, it's not just me. Thanks, África, I appreciate it.

Well, now that I'm a bit calmer even though all the world's systems have collapsed, with everything that means for business and society... maybe I'll make some pancakes to help with this terrible hangover I must bear with. Oh, right, I don't know the recipe... Let me see if I can find that cookbook my mom gave me... Who thinks it's a good idea to gift a cookbook in the 21st century? Although right now, it's the only thing that's actually useful, to be honest.

After eating the best pancakes of my life, the doorbell rang. It was my friends, worried that something had happened to me (though, just in case, they came after stuffing themselves with a massive breakfast, not before).

We've obviously been talking about the hot topic: the fall of the companies that control our favorite pastimes. Maite told us she heard on the news that before all this happened, around 177 billion emails were sent and received daily, 1.3 billion Instagram posts were uploaded, and 1.6 million packages were shipped by Amazon every day. No wonder this is pushing us toward a global crisis...

Even so, we concluded that there are probably a lot of people who will be grateful for what's happened: small businesses, the environment, people who work weekends, the non-competition of these giant multinationals... and us too. It's been a long time since we sat down to just talk about life and reflect on stuff without pulling out our phones to see who's right.

After my friends left, I turned the TV back on and watched a movie on La Noche De... that had already started 15 minutes earlier, exactly like our grandparents used to do. I never understood it before, but today, watching the movie that way made me feel a little bit closer to them.

Honestly, aside from the hangover, it's been a good day. Tomorrow's Sunday, and since I won't have an alarm to wake me up early in the morning, I might bake a little cake and invite my mom over to try it. That way, she won't be able to ask me again whether I've used her recipe book...



HOW TO BUILD A VIDEO GAME CONSOLE

BY BIZKAIATECH EDITORIAL TEAM / ILLUSTRATION GORKA OLMO



THE MAKER CULTURE

The maker culture promotes learning through action, in an informal, playful way, with a free-spirited character that fosters the creation of networks among creators. These individuals share values like cooperation, solidarity, accessibility, creativity, and education (among others) through this culture. But let's focus on the digital realm, which is our specialty. By using low-cost hardware tools and open-source software, it's possible to create alternatives that are just as good as commercial solutions.

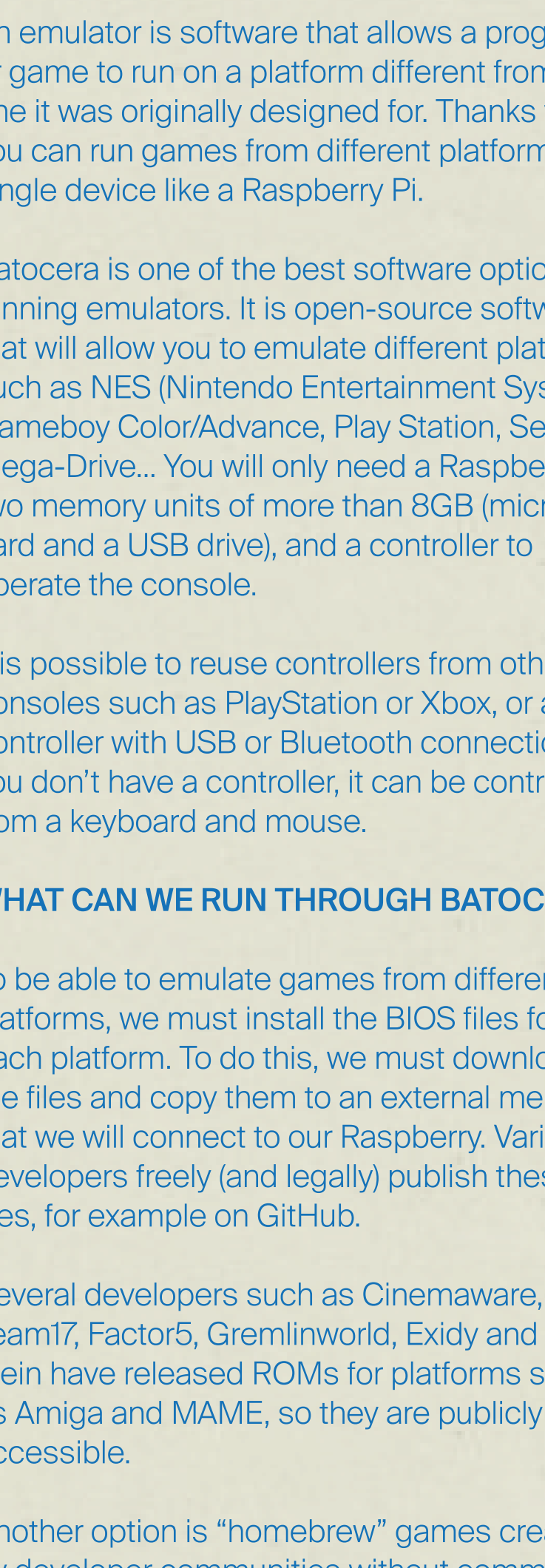
Along the way, you develop critical thinking, practice problem-solving, and work in a self-taught manner.

One of the most popular tools in maker culture is the Raspberry Pi. And no, we're not talking about fruit or the math formula. It's a small device launched in 2012 by the Raspberry Pi Foundation. Its original goal: to make computer science education accessible to all in academic settings.

WHAT IS A RASPBERRY PI??

The Raspberry Pi is a compact, ultra-low-cost computer (around €50) that makes computing accessible to anyone eager to tinker. On a small board, it incorporates all the components of a traditional computer (CPU, RAM, USB ports, network connection...). One of its biggest strengths is its compatibility with open-source systems, which allows you to customize the device as you like.

YOU DEVELOP CRITICAL THINKING, PRACTICE PROBLEM-SOLVING, AND WORK IN A SELF-TAUGHT MANNER



WHAT CAN YOU DO WITH A RASPBERRY PI?

• Multimedia Center – Kodi

A typical use for these devices is setting them up as multimedia centers, where you can store content like movies and music. Using open-source software such as Kodi, OpenELEC, or LibreELEC, you can organize and play all kinds of media through a simple, intuitive interface.

• Personal Server – Web, files (NAS)...

You can also create a personal server to host a website, keep a backup of your files, and access them from any device.

• Home Automation (Domotics)

Its low cost and the massive developer community behind Raspberry Pi make it perfect for getting started with programming. In fact, it was born with educational purposes.

• Programming Education

Its low cost and the massive developer community behind Raspberry Pi make it perfect for getting started with programming. In fact, it was born with educational purposes.

• Emulation (Retrogaming)

Lastly, Raspberry Pi is powerful enough to run games from various old consoles. With the right emulators, you can play games from systems like NES, PlayStation, GameBoy, and more. You can even use PlayStation or Xbox controllers, or any USB/Bluetooth-compatible gamepad. If you don't have one, you can control it with a keyboard and mouse.

WHAT IS BATOCERA AND WHAT DO YOU NEED TO INSTALL IT ON A RASPBERRY PI?

An emulator is software that allows a program or game to run on a platform different from the one it was originally designed for. Thanks to this, you can run games from different platforms on a single device like a Raspberry Pi.

Batocera is one of the best software options for running emulators. It is open-source software that will allow you to emulate different platforms such as NES (Nintendo Entertainment System), Gameboy Color/Advance, Play Station, Sega Mega-Drive... You will only need a Raspberry Pi, two memory units of more than 8GB (micro SD card and a USB drive), and a controller to operate the console.

It is possible to reuse controllers from other consoles such as PlayStation or Xbox, or any controller with USB or Bluetooth connection. If you don't have a controller, it can be controlled from a keyboard and mouse.

WHAT CAN WE RUN THROUGH BATOCERA?

To be able to emulate games from different platforms, we must install the BIOS files for each platform. To do this, we must download the files and copy them to an external memory that we will connect to our Raspberry. Various developers freely (and legally) publish these files, for example on GitHub.

Several developers such as Cinemaware, Team17, Factor5, Gremlinworld, Exidy and Video Klein have released ROMs for platforms such as Amiga and MAME, so they are publicly accessible.

Another option is "homebrew" games created by developer communities without commercial purposes. Among them, we suggest trying itch, pdroms and nesdev.

References

TUTORIAL

Legislation >

¿Es legal descargar ROMs? Descubre lo que dice la ley en nuestra guía completa | ESLEGAL.info

Free games >

Malagueños originales y libres: ¿Donde conseguir juegos y ROMs legales de libre descarga para tus emuladores? (la magia del homebrew).

ONE OF THE MOST POPULAR TOOLS IN MAKER CULTURE IS THE RASPBERRY PI. AND NO, WE'RE NOT TALKING ABOUT FRUIT OR THE MATH FORMULA

Annex – Detailed Tutorial

1. How do we install Batocera?

First, we will download and install the Raspberry image generator from the official Raspberry website. Then, we search for and download the Batocera image for our Raspberry from the Batocera website.

We connect the memory unit to our computer and open the Raspberry image generator. In the operating system field we choose custom, a file browser window will open where we select the image we have downloaded. In the storage unit field we choose our memory unit, where all content will be deleted and an executable image of Batocera will be installed.

The program will ask us if we want to apply OS personalization settings, to which we must say no.

It will also ask if we want to delete all data from our USB memory; we must say yes to continue the process.

Once the process is completed, we can eject the memory and insert it into our Raspberry Pi. The first time we start it, it will take some time to complete the configuration.

***Downloading and running emulators is legal, as the written code is different from the original code. Downloading and running games goes against intellectual property rights.**

BATOCERA IS ONE OF THE BEST SOFTWARE OPTIONS FOR RUNNING EMULATORS. IT IS OPEN-SOURCE SOFTWARE THAT WILL ALLOW YOU TO EMULATE DIFFERENT PLATFORMS

2. How do we install the emulators?

To be able to run games from different platforms, we must install the BIOS files for each platform. To do this, we must download the files and copy them to an external memory that we will connect to our Raspberry. Various developers freely publish these files, for example on GitHub.

Once the files are downloaded and unzipped, we copy the BIOS into the BIOS folder within the Batocera system. While running Batocera on our Raspberry with our external memory connected, we press F1 to open Batocera's file manager and copy the BIOS from the memory into the BIOS folder.

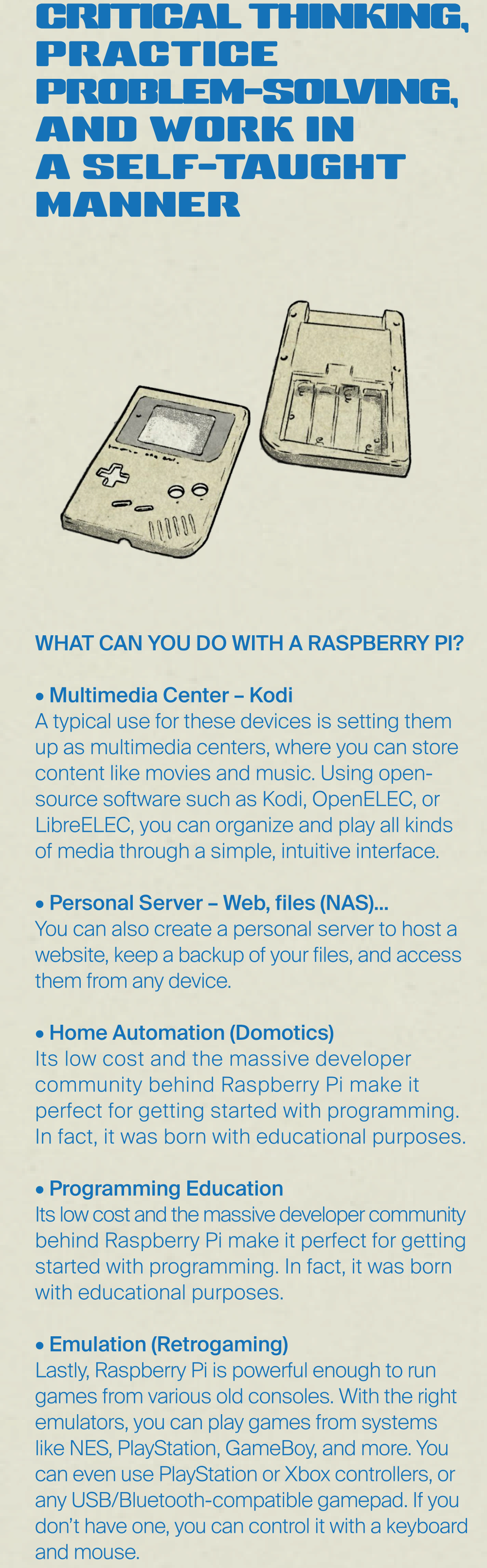
Once copied, we restart Batocera and all emulators whose BIOS we have copied will now appear.

3. How do we install the games?

Several developers such as Cinemaware, Team17, Factor5, Gremlinworld, Exidy and Video Klein have released ROMs for platforms such as Amiga and MAME, so they are publicly accessible.

Another option is "homebrew" games created by developer communities without commercial purposes. Among them, we suggest trying itch, pdroms and nesdev.

Just like with the BIOS files in the previous step, we must download and unzip these ROM files. We will copy them into the roms folder, inside the folder of their corresponding platform.



SOUL TECH

NOBODY RINGS MY DOORBELL ANYMORE

BY **BIZKAIATECH EDITORIAL TEAM** /ILLUSTRATION **PAULA GARCÍA**

It's the summer of 1985, and the wind dances to the rhythm of *Everybody Wants to Rule the World* by Tears for Fears. Josu just rang my doorbell, and after asking my ama for permission, I head down to the street to see what the day has in store. Maybe we'll play football, maybe we'll buy a pack of sunflower seeds, or maybe we'll hide behind a bush to see if Ane and Andoni finally kiss; it's about time. One thing's for sure: when night falls, we'll be looking at the stars. We only know how to find the Big Dipper, but it doesn't matter; it's the best moment of the day.



Even though it's now the summer of 2025, Josu and I are still friends. In fact, he just messaged me on WhatsApp to grab a drink at our usual bar; we're meeting at five. We love doing the crosswords in the newspaper that's always lying around at the bar, but we always end up looking something up on Google, otherwise, there's no way to finish it. We're still super nosy, too: the hours we spend stalking people we used to know on Instagram! But even with all the time that's passed, one thing hasn't changed: we still love watching the stars. Now, though, thanks to an app, we know where to find Orion, Lyra, and Taurus. Sometimes we even spot Venus, which amazes us. Seems like the Big Dipper isn't enough for us anymore.

LIVING ON AUTOPILOT

As time went on, technology slowly crept into our lives: first through radio and television, then mobile phones, later home Internet, and with smartphones and laptops, our daily routines were completely turned upside down. Our alarms go off on our phones, we eat breakfast while watching the news, we drive to work with the GPS on to check for traffic, we work on a computer while listening to music on Spotify, search everything on Google and ChatGPT, and when we want to relax in the evening, we throw on a movie while playing a game on our phones. And the next day, we go back and do the exact same thing all over again.

There's no doubt technology has brought us amazing things; no one's denying that. But is it really necessary to use as much tech as we do every single day? Could we be overusing it?

BUT IS IT REALLY NECESSARY TO USE AS MUCH TECH AS WE DO EVERY SINGLE DAY? COULD WE BE OVERUSING IT?

TELL ME ABOUT YOU

The global average screen time is nearly seven hours. A day has 24. That means we spend almost 30% of the day staring at a screen or a device. And if we subtract sleep time, the day suddenly feels very short.

Spending that much time looking at a glowing rectangle takes a toll in many ways (not to mention the obvious toll on the environment, as we talked about in our previous issue), and not just the obvious things like eye strain, social isolation, or anxiety and depression, among many others.

The first thing that comes to mind is our thinking ability. Do you remember the last time you argued with someone for more than two minutes? The instant access to information is cutting short our capacity for discussion and meaningful conversation. Are you debating whether the killer in *The Silence of the Lambs* (1991) was played by Anthony Hopkins or Anthony Perkins? One quick Google search and you've got your answer. And then, onto the next thing.

In her book *Reclaiming Conversation* (2015), MIT professor and author Sherry Turkle argues that having meaningful conversations with our family, friends, classmates, and coworkers helps us develop self-awareness, empathy, and intellectual skills. As she puts it: "This is not an anti-technology book; it's a book in favor of conversation. We can enjoy and benefit from technology without giving up conversation. I'd go even further: this is what we need to learn to do, because conversation is essential to our humanity, our creativity, our work, and our ability to live as a family."

THE LAW OF MINIMAL EFFORT

Then there's the issue of laziness. What a topic, huh? Having access to information in two seconds doesn't even satisfy us anymore and that's why there's a growing trend of replacing search engines with generative artificial intelligence.

According to Search Engine Land, Google's organic and paid CTR (Click Through Rate, a metric that measures how many clicks your content/ad gets divided by how many times it's shown) is at a historic low. One reason for this is Google's AI Overviews, which gives you instant answers to your questions. On top of that, more and more people are using generative AI (like ChatGPT, for example) to find answers without digging through dozens of links on a search engine.

And why is this a problem? Because when we do that, we're not working on improving our digital literacy, which is the ability to locate, analyze, organize, understand, and evaluate information using digital tools. Being able to tell good sources from questionable ones, reading different viewpoints, and strengthening our critical thinking skills is worth way more than a quick answer. And let's be honest: it's really not that hard.

LOOK UP

The thing is that if technology controls our whole life, then life stops truly being ours. It's up to us to make the effort to search, analyze, and dig through the tools we have available and make the best possible use of them to live a full life, filled with opinions, conversations, and thoughtful critique.

Because even though technology is an essential ally in our lives, we can absolutely choose to do without it when it comes to connecting with people and the world around us. Let's try to find the beauty of the Big Dipper again.

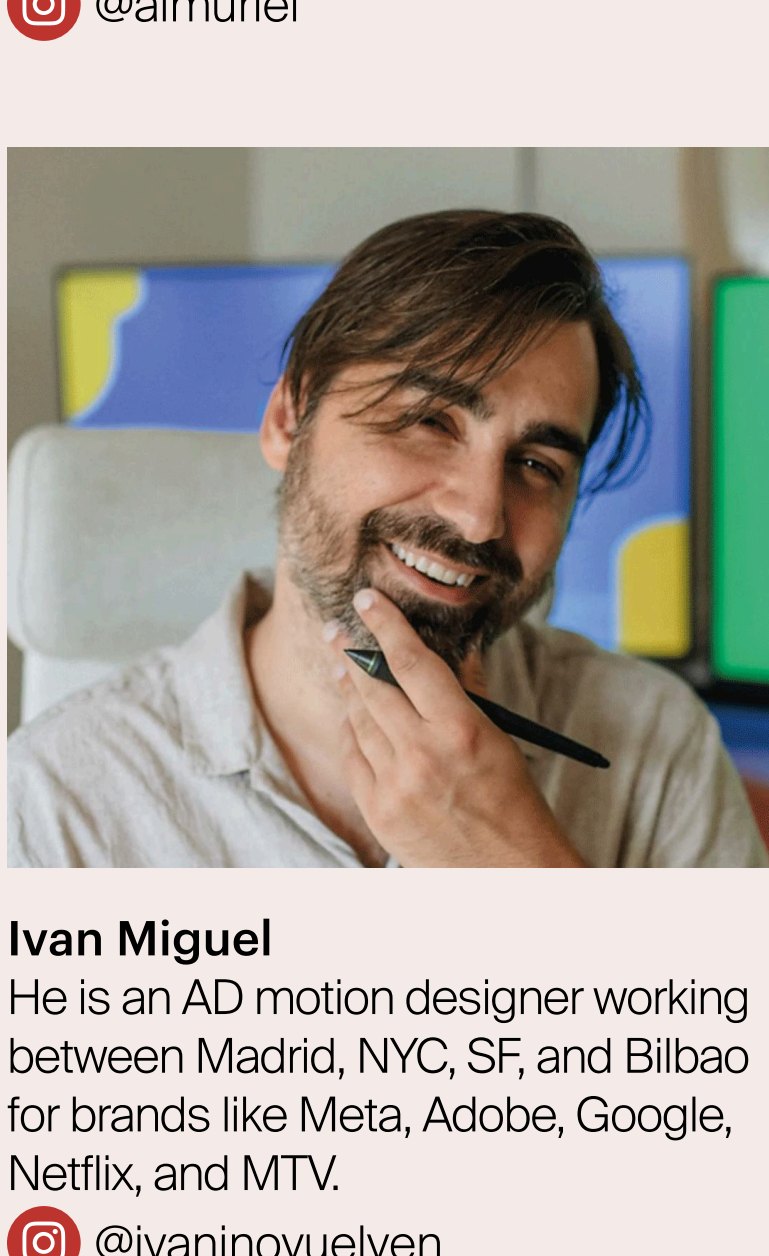
And now that I'm old enough to go outside without asking my ama for permission, the next time I want to hang out with Josu, I won't message him on WhatsApp; I'll go to his house and ring his doorbell.

CONVERSATION IS ESSENTIAL TO OUR HUMANITY, OUR CREATIVITY, OUR WORK, AND OUR ABILITY TO LIVE AS A FAMILY



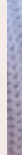
THERE'S NO ART WITHOUT ARTISTS

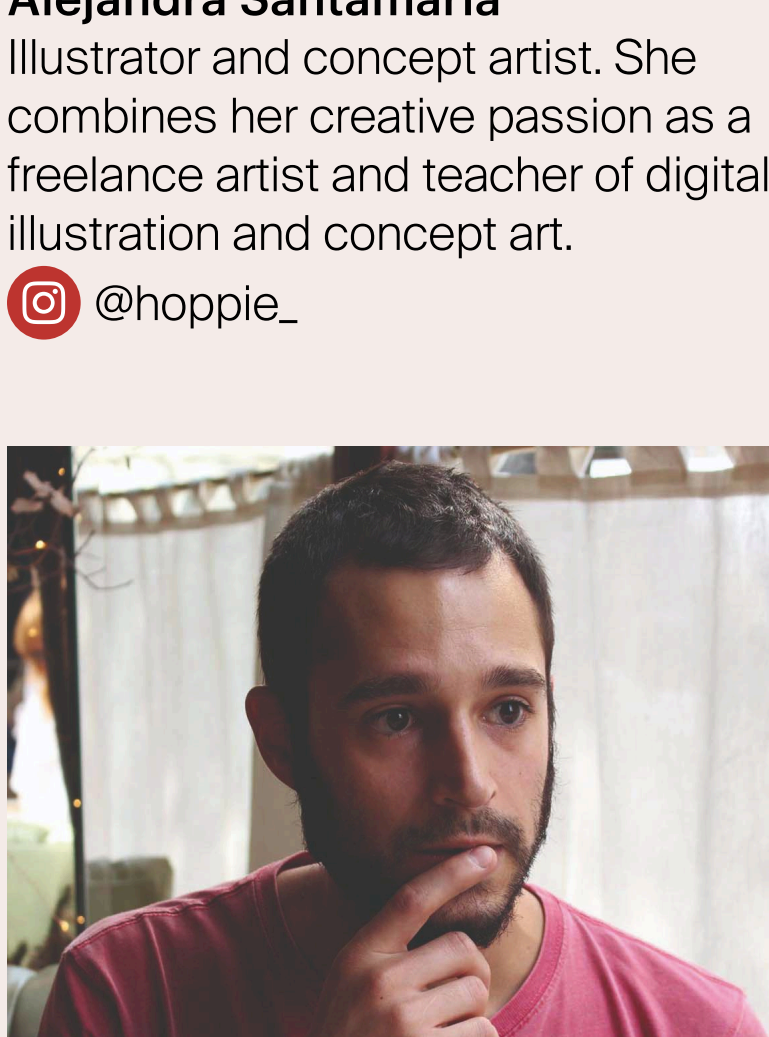
ARTISTS OF ILLUSTRATION



Alberto Muriel

Illustrator specialized in graphic storytelling and live drawing at events. You can also see his drawings in comics, books, magazines, albums, and various walls.

 @almuriel



Ivan Miguel

He is an AD motion designer working between Madrid, NYC, SF, and Bilbao for brands like Meta, Adobe, Google, Netflix, and MTV.

 @ivaninovuelven



Alejandra Santamaría

Illustrator and concept artist. She combines her creative passion as a freelance artist and teacher of digital illustration and concept art.

 @hoppie_



Gorka Olmo

He is one of the most talented young illustrators in Spain and has published his drawings in media such as El País Semanal, Vanity Fair and Forbes.

 @gorkaolmo



Julia Gris

1996. I draw more than I speak: to understand myself and to open paths of connection with anyone willing to look.

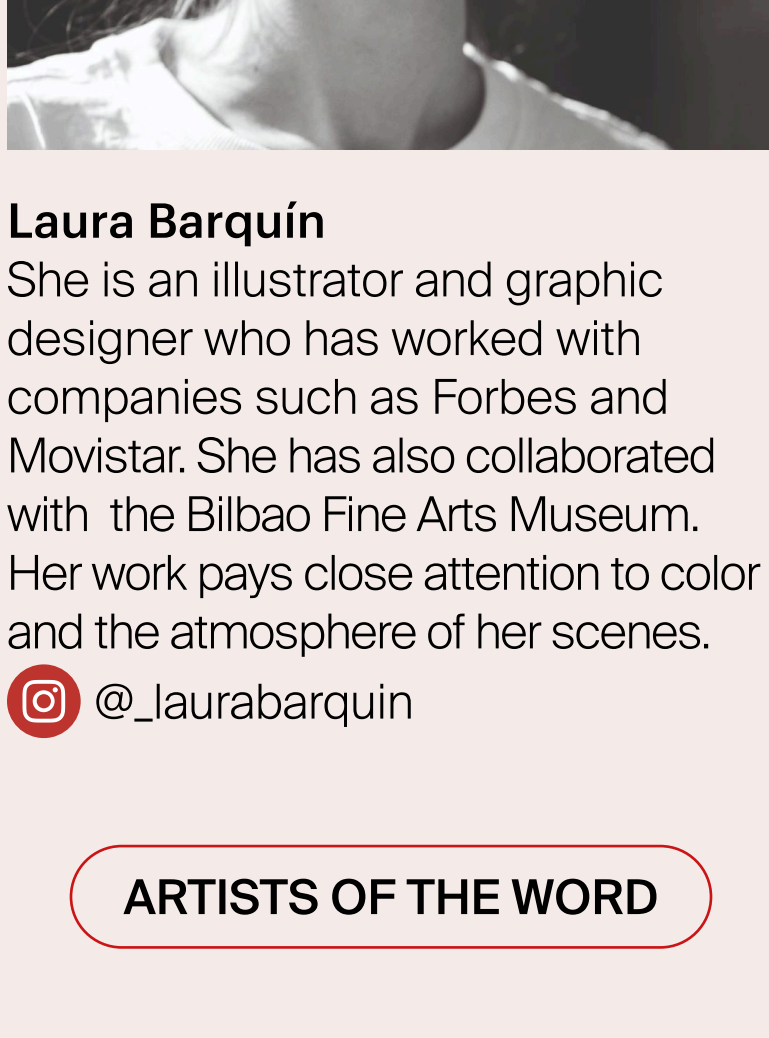
 @grishacecosas



Iñaki Landa

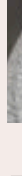
A firm believer in the power of images as a tool for social transformation, his visual metaphors appear across various social organizations, publishers, magazines, newspapers, and campaigns.

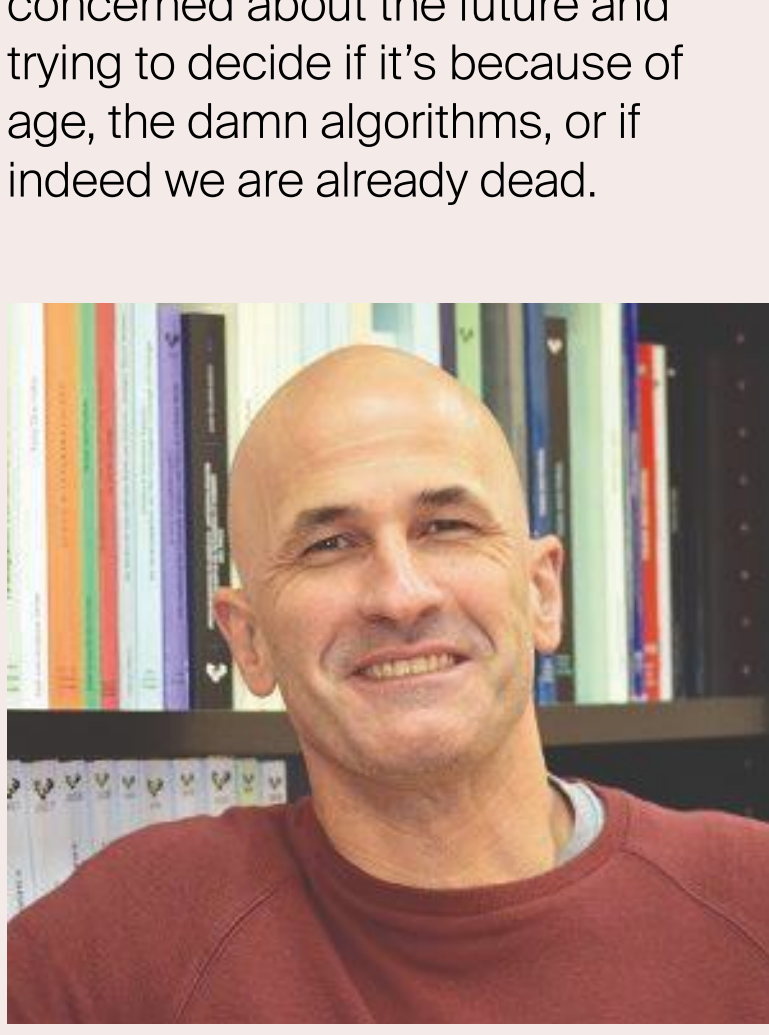
 @inaki_landa_



Jon Ander

Illustrator focused on telling stories that connect us to our magic and essence, allowing us to recognize ourselves through beauty.

 jonanss88.wixsite.com/hegan/disenio-grafico



Paula García

She is an illustrator from Bilbao with a degree in Fine Arts from the University of the Basque Country (UPV), later specializing in ceramics, to which she applies her unique style.

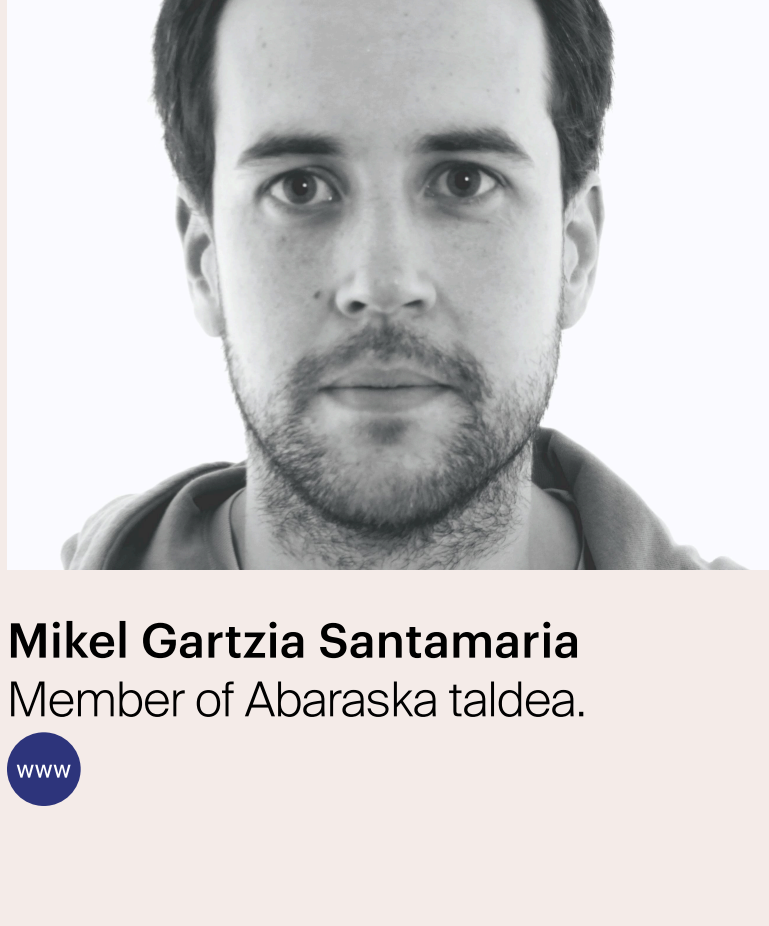
 @srta_antonia



Pablo Gallo

Painter, illustrator, and writer. Author of 8 books and contributor, as an illustrator, to more than 60 titles published by literary publishers.

 @pablogalloo



Gorka Gil

His work speaks of ecology and feminism, through aggressive messages delivered with a visual language that is friendly and accessible to everyone.

 @gil_gorka

Laura Barquín

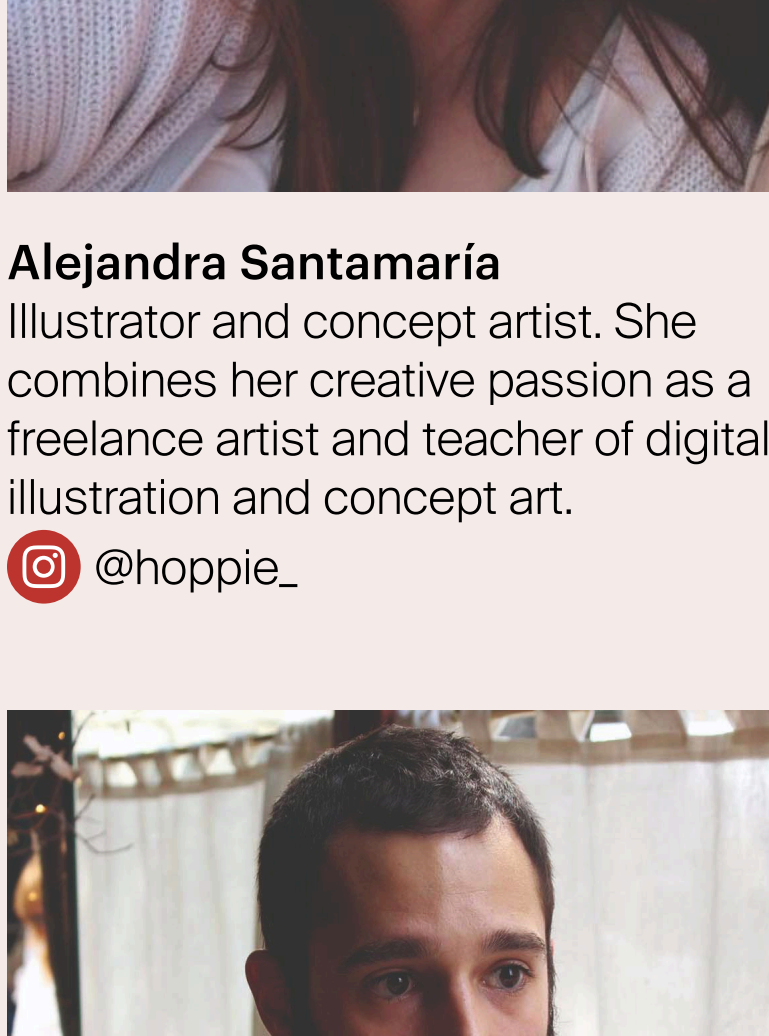
She is an illustrator and graphic designer who has worked with companies such as Forbes and Movistar. She has also collaborated with the Bilbao Fine Arts Museum. Her work pays close attention to color and the atmosphere of her scenes.

 @_laurabarquin

ARTISTS OF THE WORD

Ekai Txapartegi

Associate professor. Increasingly concerned about the future and trying to decide if it's because of age, the damn algorithms, or if indeed we are already dead.



Iñigo Galzacorta

PhD in Philosophy and professor in the Department of Philosophy at UPV/EHU. Member of the interdisciplinary research group GAIT.

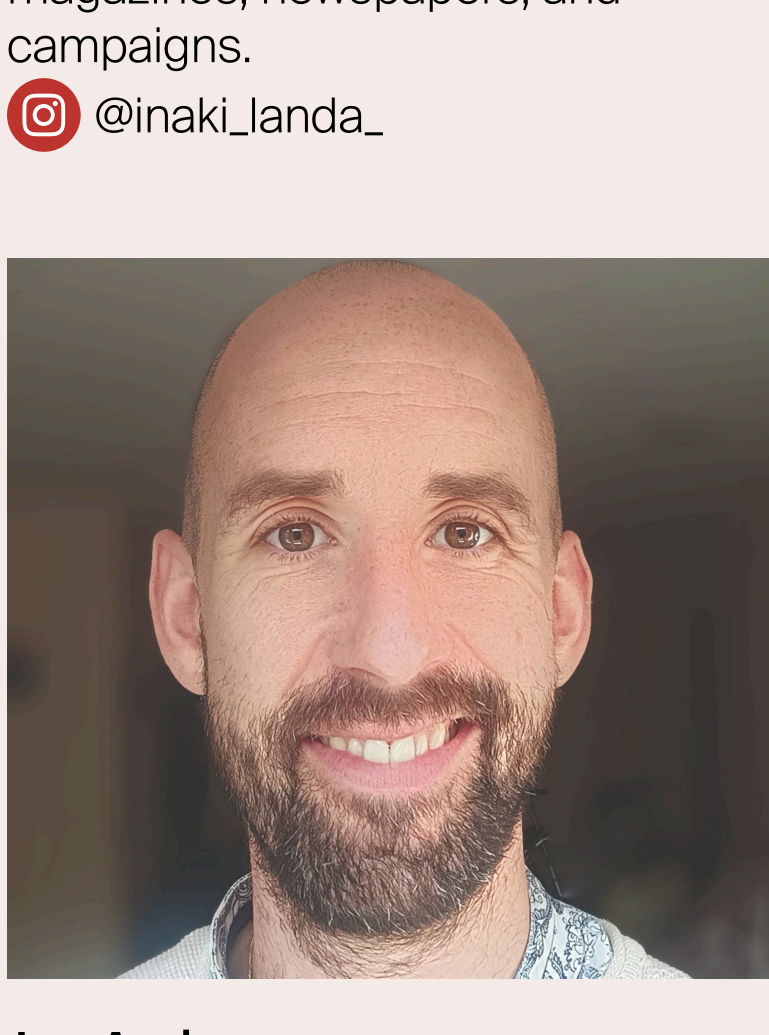
WE COULDN'T HAVE DONE IT WITHOUT...



Stefanos Kotoglou

Programme Officer at the European Commission, where he steers digital transformation and innovation within EU public administrations.





Alex Borg

Project manager and research associate at the Lisbon Council.





Mikel Gartzia Santamaria

Member of Abaraska taldea.





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On the cover: **Iván Miguel**



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CREATORS: THIS IS YOUR PLACE

If you constantly question everything, you have nonconformity as a flag and you always want to know more, you are in the right place.

BizkaiaTech Magazine is a space open to collaboration and participation where you can claim your talent and satisfy your curiosity. We invite you to show what you do: your digital art, your reflections on technology or life, raise new topics or present fresh, bizarre or different ideas.

If you would like to collaborate, send us an email to bizkaiatech@bizkaia.eus and we will be happy to know what you have in mind.

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