

 **BLOG**

#lavorobenfatto

– by Vincenzo Moretti



The day you sow is not the day you reap. The story of Demetrio Ferro, researcher, mentor, activist.

 November 5, 2025  Vincenzo Moretti  Innovation , Research , University



English Version
by Demetrio Ferro

Dear Diary, today I'm telling you the story of Demetrio Ferro , who turns 35 next month. He holds a degree in telecommunications engineering from the Polytechnic University of Turin and a degree in computer engineering from the University of Salerno, and a PhD in neuroscience from the University of Trento. His education didn't include biology, but he studied it afterward, taking supplementary courses.

Demetrio is from Caselle in Pittari but currently does research at the Institute of Biomedical Engineering at the Pompeu Fabra University in Barcelona . Specifically, his research center, the Center for Brain and Cognition, focuses on neuroscience in the strict sense, and therefore the foundation, the starting point, is brain cognition.

Sorry, my friend Diary, but I haven't told you yet that I would never have known all this if it hadn't been told to me by Mrs. Velia Pellegrino, Demetrio's mother. This summer, in addition to delighting us with her dishes at Lido Smeraldo , she often gave me rides on the way back from Policastro Bussentino to Caselle. That's how I discovered Demetrio, his studies, and his work; the rest came naturally: I was intrigued, I asked Mrs. Velia to tell him I'd love to hear his story, and one morning in August we met at the lido, along with my friend Sergio Vitolo.

We said goodbye, had a coffee, and then I told him about my idea: to tell his story with a brief introduction and five words of his choosing. It was the narrative experiment I'd begun with the story of Francesca and Pasqualino , and it had yielded excellent results, so I wanted to continue down that path. Demetrio replied that it was fine with him and asked if we could meet up again later, just in time to take a walk to meet up with some of his friends and say hello, and of course we did. We met around 11:30, after Demetrio had gone for his walk and Sergio and I had our daily swim, and then we were ready, steady, go, and off we went.

Vincenzo, along with neural anatomy, over the course of my years of research, I've become deeply passionate about the physiology of cognitive processes. I'll tell you right away that, from a certain perspective, distinguishing whether logic or cognition came first is a bit like the chicken-or-the-egg game. It's very difficult to determine, since cognition creates logic, but without a logical connection, there is no true cognition. Among biologists, there's a widespread belief that cognition enables our spatial movement, something plants don't do, which is why they haven't developed these functions. In any case, I dream of one day engaging in a discussion on these aspects with various prominent scientists, including Professors Stefano Mancuso and Giorgio Vallortigara, whom I particularly respect.

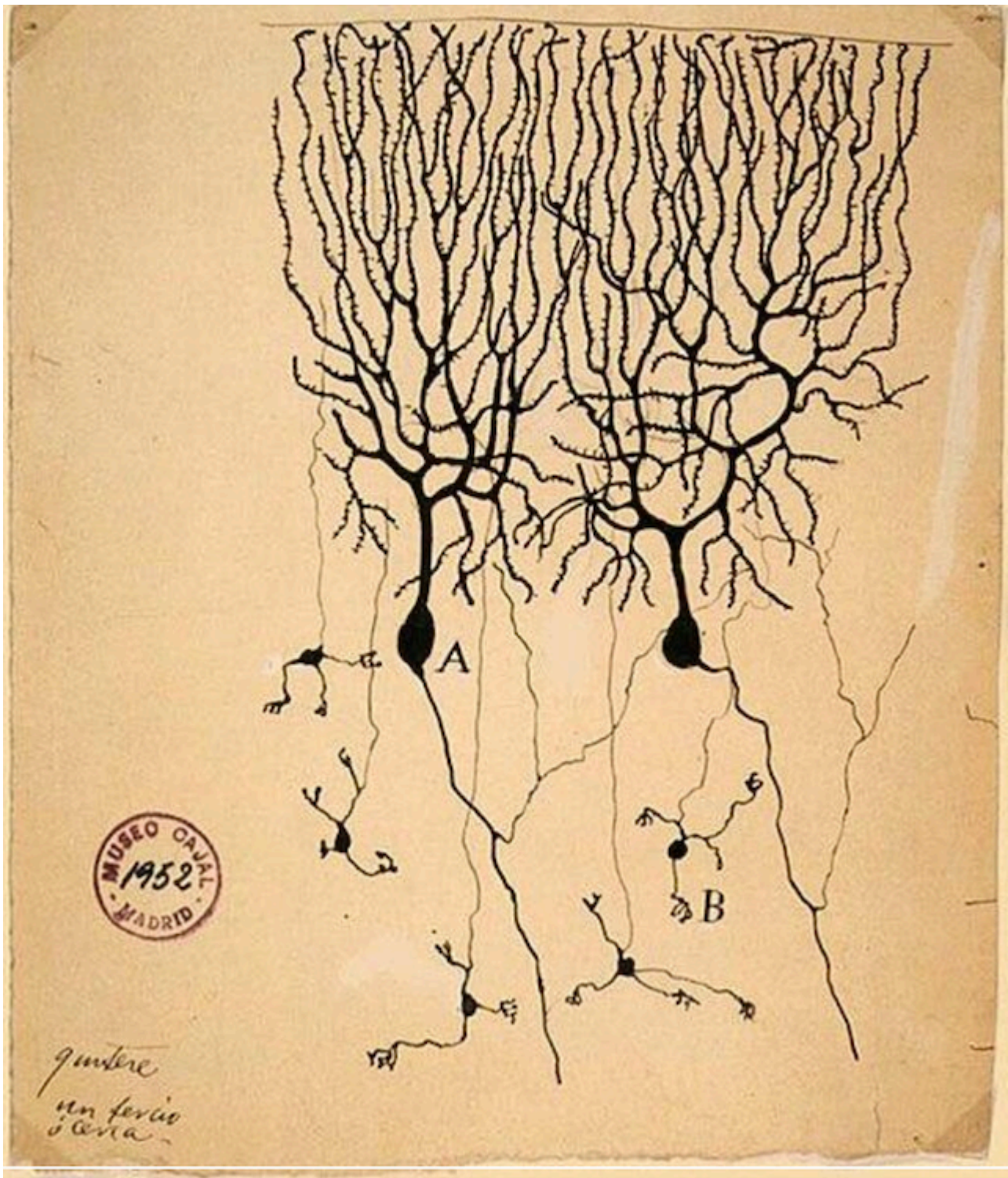
To conclude this brief presentation, I'd like to add the slogan, the maxim, that unites all aspects of my personal development: 'The day you sow is not the day you reap.' A maxim that actually has a following: 'The best day to plant a tree was 20 years ago, the second best day is today,' which means that even if things could have turned out differently, it's never too late to change them. In short, you can always get involved and achieve your goals, even if gradually, that's fine. You see, even though I'm 'only' 35, I have so many different things in my bag, not just in terms of studies but also work, participation, and activism.

“That sounds like a good start. How about starting with your first word?” I suggested at this point.

“Of course. My first word is **Arborization** ,” he replied.

“It's a word that makes me think of all the others I've chosen and that, from a professional point of view, characterizes me. You should know that neurons have two fundamental parts, the axon and the dendrites. There's an illustration of a neuron and dendritic arborizations available for

free access on Wikimedia from the Santiago Ramón y Cajal Institute, Madrid, Spain. I'll send you the [link](#) later , which can help you and anyone else reading this understand better. In the center you can see the cell nucleus (A), also called the soma; the upper part represents the dendritic arborization; the lower part represents the axon.



Essentially, dendrites are the part of the neuron that extends toward other neurons to form connections. Simply put, arborization is the process by which these branches form until they reach another cell, allowing them to connect by forming synapses. This process creates actual networks of neurons, now better known as "neural networks." It's a long process, beginning during our cognitive development and continuing to adapt throughout our lives through the process of neural plasticity, which strengthens or weakens these neural connections based on the significance of these interactions in our experience.

In my research, I try to bring together many concepts I've studied from a formal, mathematical perspective, applying them to neuroscience, that is, to the study of our cognitive functions and their dysfunctions in the case of mental disorders. The work of many scientists in the field inspired me greatly, both at the beginning of my journey in studying neuroscience and in my decision to continue exploring a theory I had already formally developed. Among the most influential Italian neuroscientists, I would certainly mention Professor Marcello Massimini and Professor Maurizio Corbetta, who particularly inspired me.”

“Help me understand better, Demetrio.”

I'd say the fundamental observation is that there's a wide variety of stimuli in the world, theoretically an infinite number of them that our brain can process. This is a fact that happens despite it being formally impossible, in the sense that mathematically, you can't represent infinite things in a finite space of neurons, of cells. It's this fact that intrigued and impressed me so much. Massimini's research path introduced the interesting notion that certain cognitive anomalies lead to a reduction in what's called entropy, that is, the variability of stimuli that are represented, or at least the variability of brain signals. Corbetta's work, on the other hand, struck me for the strong connection between the study of cellular physiology and their function in highly complex cognitive mechanisms, such as attention.

Starting from this inspiration, I began to work at a more fundamental level, in the sense that while they studied the brain already functioning and with pathologies, I tried to understand how the atomic entities of cognition are represented, that is, the true and proper, and that's how I understood that attention is the fundamental concept that makes it possible to represent infinite objects in a finite space of cells.

Attention is the key to all this, in the sense that it allows neural processes to focus on specific variables, and in fact, most cognitive or neurodegenerative pathologies are often related to attention disorders, that is, the difficulty in maintaining attention either as cause or effect, in controlling impulses, and in regulating behavior.

The most well-known form of attention disorder is Attention Deficit/Hyperactivity Disorder (ADHD), and its manifestations include inattention, hyperactivity, and impulsivity, which can persist into adulthood and have a negative impact on education, work, and social relationships. Other attention disorders can result from brain damage, such as strokes or dementia, and all of this is linked to the fact that information exists as a focus of attention, that is, as a representation of something as such.

Ultimately, I would say that my research work is a connection between artificial logic networks, which are those that I studied engineering, and neural networks, which are what determine human cognition.

I imagine that despite my efforts to simplify, it's not always easy to follow, but the theme associated with the word is complex. However, as we continue, it will become clearer why this is the first word I chose.”

"Okay, I trust it, more than that, I like it. And then over the years I've learned that when you explore new worlds you also have to accept that you don't understand everything, otherwise you remain confined to your comfort zone, or worse still, on an Indian reservation. Let's get to the second word."

“Vincenzo, **Roots** . It's the word I chose to describe where I started.

I realize I'm not very original, but the first thing that comes to mind when I think of roots is the bond with my family and my land.

To begin with, you should know that I'm very attached to my grandfather, whose name I bear and who left a great impression on me. He's 81 years old, and last year he was very happy that I came back specifically to celebrate his 80th birthday.

Grandpa Demetrio taught me from a young age what important plants were, how to recognize them and identify their mutual role, in short, what I later understood to be a biosphere, even if I didn't know it at the time. Yes, the first figure that comes to mind is him, my grandfather, a pruning expert, known for his skill throughout the Gulf of Policastro.

After my grandfather, definitely my father, even though I had a much stronger bond with him as an adult. Even my relationship with him, being among other things the foreman of the The mountain community of Bussento Lambro Mingardo, was very attached to the topic of agriculture and vegetation ("es lo que hay," or "it's what we have available," as the Spanish say). He taught me so much, plant varieties, grafting techniques, for example, or how to tie vines, create rows and then also prune olive trees, or search for plant varieties based on the soil and other things like that.

Working with rows in particular taught me a lot, for example to have a lot of patience. Even my slogan speaks of the need for a lot of patience. And I would say that Cilento is also a master of patience.

I would add that the fact that at times I felt I wasn't in the right place also gave me a lot of patience, including when I was "forced," let's say, to work with my father, to help him more out of social inheritance than by my own will. Actually, I would have liked it, but from a social standpoint I didn't feel comfortable, primarily because it didn't give me the opportunity to make the choices I wanted, for example buying a new cell phone or the computer. It's no coincidence that I bought the one I started studying with with my first job outside the home, "abandoning"—in quotation marks—my career with my father and starting to work in the restaurant industry, the same sector in which my mother worked and still works.

“You’re basically referring to work as autonomy.”

"Exactly. When I took the initiative and started working outside the family, I became more independent; I had access to the money I earned. Speaking of feeling like I didn't belong, I'd like to add a little about Caselle in Pittari."

“Go!”

I'd like to start by saying that I'm very proud to have been born and raised in Caselle; my community provided me with so much social, cultural, and political inspiration during my adolescence. As the years passed, however, I felt a growing sense of unease, of not belonging, as if its identity had gradually been lost, and this meant that over time I no longer recognized myself in it. It's likely that this was also due to the type of administration we've had for so many years—you can write that down, it's my opinion, and everyone knows it.

Instead, I recognize great strength in some people at the Pro Loco who, in my opinion, have done a great job, starting with the Palio. I'm thinking, for example, of Antonio, Jepis, and Jolly (Demetrio's peers, ed.). In short, while I recognize Caselle's cultural power and great capacity for welcoming, I also see many opportunities that aren't being seized as they should be—I'm thinking, for example, of Laurelli, the restoration and valorization of our environmental assets,

and sporting activities. I reiterate that it's This is just my point of view, but these are things that sadden me and weaken my ties to my homeland.

I want to tell you something about swimming, which may seem secondary, but in my opinion it isn't. Swimming has taught me so much, beyond the banal act of staying afloat, which, thinking about it now, I wish I'd learned sooner, but in Caselle and the surrounding area there wasn't a pool. It taught me, for example, that I need to monitor my breathing, that even when my body hurts, the problem is actually my breathing, not my body, and this has opened my mind to the divergence between what I feel and what I actually need to work on. I've been swimming regularly for over ten years now and I love it; it's an activity that allows me to release the stress and frustration I deal with in my daily life.

Having said all this, I'll add, in all honesty, that perhaps I'm part of the problem, too, because I left home. However, with my cultural and scientific background elsewhere, I can express my potential in a way that objectively isn't possible in my homeland, and therefore that's fine."



"I'll try to guess the next word: **Divergence** ."

Yes, Vincenzo, you're spot on. Divergence is a word I like for many reasons, including the fact that it makes me think of ramifications, and therefore of arborization. In my specific case, however, as a word it's connected to the fact that I had to go through many parts to discover and become who I am today, including the fact that I've been in many places, to Turin, six months in France, in Trentino, and from Trentino to England, and now in Barcelona. Yes, I'd say there's this divergence in my life.

Another important aspect of the word divergence, for me, is that it has to do with the verb *divergere*, which in some way also has to do with diversity, being different.

There's a lot of me in this part, there's my activism already as a student who, at university, fought for access and the right to study, for scholarships and housing, and then for environmentalism, legality, social inclusiveness and so much more. On the topic of housing, I'm still Barcelona is very much involved in this issue today due to the economic bubble created by tourism, over-tourism, etc., but it is an increasingly international issue.

I have also been active in various fields with Open Arms , the Spanish NGO, and I am pleased to point out that I am still in contact with the Circolo Sociale Arci Marea in Salerno ; we have been great friends with some of them since university. It is a cultural center that I greatly respect; they offer hospitality and are committed to various aspects related to this issue.

I conclude by saying that my openness to diversity, multiplicity, and these different forms of activism and militancy have led me to learn many languages; I speak English, French, and Spanish in addition to Italian and dialect. On a practical level, knowing more languages also

allows you to lend a hand to people who come here and find themselves struggling with many difficulties, starting with documents to read, translate, and understand. Within this reasoning, the ramifications I mentioned at the beginning are in some way graphic expressions of the divergences. Yes, I would say that in a certain sense branching is a divergence between different branches.”

"You're truly a discovery, Demetrio, and so are the words you've chosen and the way you're inflecting them. So let's move on. Which word is it next?"

“ **Grafting** , which in my experience has often been a word associated with conflict, but it's best to proceed in order.

You see, Vincenzo, in my life I've felt like a graft many times. I imagine it's also normal for a person like me who has changed context, places, and references so many times, who has had to deal with so many different realities that have enriched him but also made him suffer, and have generated conflicts, as is probably normal.

Borrowing words and concepts from my peasant roots once again, using the vocabulary of agriculture, when a person tries to cultivate something, how does a person proceed? If it works well, he keeps going, if it doesn't work, he tries to make changes. Essentially, to improve things, he keeps the best part of what he has and changes the rest. So, basically, for me, 'grafting' has been this constant trying out new things while simultaneously trying to preserve what worked. I repeat, it's a painful process, but it also gives you a lot. Naturally, everything would have been easier if I had been able to get to know many parts of myself first, for example, learning to swim, or even go sailing. mountains, which I did in Trentino and only later here, going, for example, to Bulgheria and Cervati.

Doing what we like where we like is very nice, even when it creates other conflicts, because, for example, you see firsthand how much work still needs to be done to properly enhance our beautiful territory.

'Why can't I find well-maintained and functioning trails like those in Trentino if I go to Bulgheria?' you ask yourself. 'And why aren't the sheepdogs kept under control like they are there?' These are good questions, and also a bit rhetorical, especially if, like me, you're the son of a mountain community team leader and are more aware of the reasons why certain things remain the way they are. That said,

I'd add that I'm happy with the beautiful and positive things that are starting to happen in our area too; the Cammino di San Nilo is one of them, and we mustn't forget to remember it.

“Very good, we're at the last word, which one did you choose?”

“ **Mission** , which in my opinion is the ability to see the change you want in the world, or rather, to be the change you want to see in the world.”

“I don't think you know this, but ' A Better World is Needed ' is the title of the afterword I wrote for the new edition of ' A Job Well Done .”

Yes, we need a better world because it's progressing, not just scientifically. You see, in my opinion, progress can't be a myth but rather something tangible, that starts with each of us, that we have to experience firsthand. Only in this way can we change ourselves and help change others, or at least influence them. It's a change that doesn't just involve militancy, activism, but also personal choices, such as having and supporting a plant-based or more conscious diet, or

fighting systematic consumerism by promoting a circular economy.

It's not about following the latest fad, but rather about feeling who we are, what we carry with us, perhaps even from a young age.

I'll give you a personal example: as a child, I couldn't eat game, and it's something I later recognized as an adult, and this "recognition" felt, in a certain sense, like a mission—at least for me, it was like that.

My mission isn't just my profession, but also my mindset, my approach to everyday things, my way of life. Seeing change, as I told you. This is what gives me hope, in my opinion.

I deal with many young people younger than me, and I don't want them to be like me, I want them to be better, to be able to fully express their potential. I really like this, I really like not just being a teacher in the academic sense of the term, but being a mentor, that is, someone who gives you a hand, who presents you with an opportunity, who gives you hope for what you want to do, what you want to achieve.

These are things that have helped me too; there have been many people in my life who have played this role and have helped me more than the classic "professor." If you think about it, most professors can be replaced by a book, by studying a manual; especially in engineering, that's the case. I hope it's not the same in the humanities. The person who gives you hope, on the other hand, is not so easily found, and when you lose them, you don't replace them so easily.

As I told you in this regard, my first references are my grandfather, my father, even my mother, who sometimes thinks I'm a missionary, in I mean, she thought I could have aspired to something more lucrative, or at least more socially accepted, than being constantly traveling the world—in short, a kind of nomad, scientific but nomad nonetheless. The funny thing about my mother, I point this out to her every now and then, is that her last name is "Pellegrino," which is actually something different from a missionary, because she's very vigilant, attentive, someone who knows, who knows his territory, like a peregrine falcon, in fact. Whereas a missionary is someone who sees something on the horizon and tries to mediate and reach it."

"We could stop here, Demetrio, but I'd like you to tell me something else, a sort of " **typical day** " of yours between research and teaching. What do you think?"

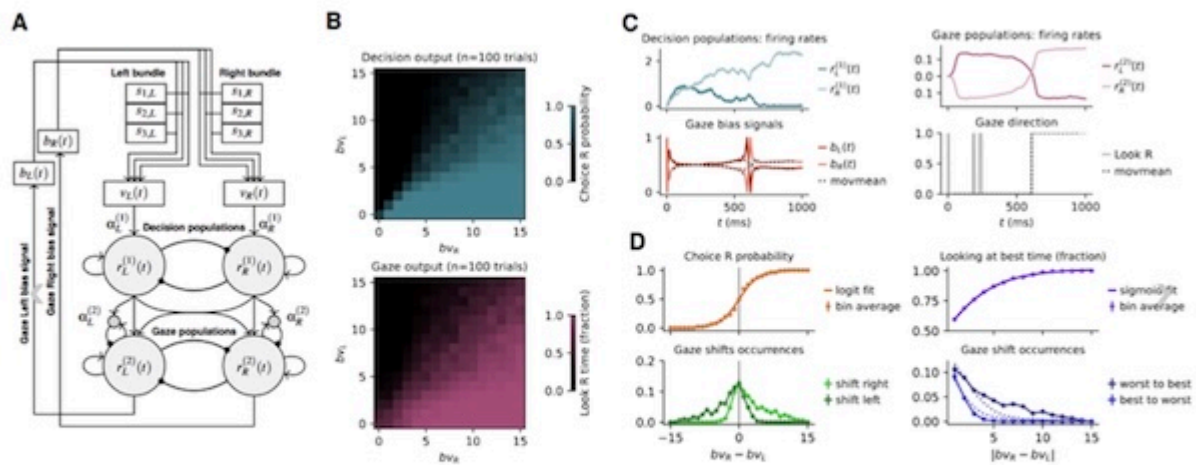
"I say it can be done. So, as you already said in your question, in my typical day as a researcher there's a more research-oriented part and a more teaching-oriented part. I'd say my job is both standard and flexible; I can work from home or in the office, depending on my needs.

There are countless hours of data analysis, which sounds repetitive, but it isn't at all. First and foremost, it's because I need to reach my goal, to produce results, which is never a linear process. Sometimes I need to stop, because, for example, what I'm producing isn't going in the right direction, just as it happens that I diverge in many directions because the research leads me to certain types of insights that then don't materialize, don't connect properly with the overall plan, and at that point I have to take one or more steps back, arm myself with patience, and reconstruct an overall vision of everything I've done up to that point and what might be useful for determining a possible next step.

From the research side, what I do is essentially this: I'm dealing with selective processes. Our brain is bombarded by stimuli, both external (reaching us through the senses—sight, hearing, etc.) and internal (those we ruminate on or visualize internally, or more simply, are led to visualize by our lymphatic system). Both processes utilize principles of selectivity.

I don't know if you know this, but we can't represent everything we see simultaneously, nor feel all sensations simultaneously.

So what our body, our brain, our central nervous system does is adaptively select what we possibly need at that moment. It does this both as rumination, as thought, and as a "flight or fight" response, that is, as a response to external stimuli that may be necessary for your satisfaction, your pleasure, your internal reward, so to speak. A huge parenthesis could be opened here, but I'll stop here. If you visit [my website](#), you can read, watch, and better understand what I do through my publications.



Closed-loop model of gaze and decision coordination.

[Ferro et al. CCNeuro 2025.](#)

Then, as I was saying, I've also taught, and continue to teach, though I've never taught a full course.

Here, if I may, I have to make a point that's not just personal but also generational."

"Of course you can."

"I'll start with the news, which isn't really news: like many others, I too, at 35, still don't have a stable position despite my work and my qualifications. There are many reasons for this, one of the most important being the reduction in research funding, which until a few decades ago selected 15% of the participants for each call for proposals, while today it doesn't exceed 7-8%. Let's say we're dealing with the global economic and fiscal crisis, and with the reckless political choices made by world leaders, with all the injustices this entails.

Having made the general consideration, I'll get back to the point and tell you that I taught both specialized courses (computational neuroscience, for example), and basic courses that are taken in the undergraduate degree (statistics, or rather basic statistical analysis).

One course that I particularly enjoyed and to which I made a significant contribution was the course in scientific communication, which aims to make science more accessible, more usable, open even to those who don't have decades of study in that field behind them. specific area. It's an issue with a significant social impact, and I taught the students some fundamental skills: write in a readable manner, use citations even formally, utilize more technical research tools, and structure a text with an introduction, methods, results, and discussion.

Even if in a very schematic way, learning to discuss among peers—essentially, a sort of moderation of debates among students—and to present research proposals addressed to both the instructor and the audience is very useful, especially considering that both instructors and

the audience evaluate the results. Naturally, the instructor's evaluation is proportionally more valuable, but the audience's evaluation also contributes to the final assessment.

Speaking of evaluations, I'd like to point out that my expectations are also motivated by the fact that I've always received very high scores from the students, who, as you know, evaluate us as instructors at the end of each course.

“It's clear you love your job.”

Yes, I like it a lot, not so much for the role itself, but because I really enjoy transmitting, shining a light on people's hearts, if you know what I mean. If that spark is missing, everything becomes boring, even the learning process.

Once again, it's no coincidence that the word you put first was arborization, with all those ideas about connections. It's not just true in teaching, it's true in research and in life too. For example, even though I live in the center of a large metropolis, on my balcony I grow my own basil, my own arugula, even my own tomatoes.

What I'm trying to say is that rhetoric isn't enough; we can't just settle for saying things; we have to do them. As far as I'm concerned, I've come to say that I need to do them. It's a kind of therapeutic process: planting the seed, watching the plant first emerge and then grow until it bears fruit. It's not an obsession, it's an approach, a mindset, and I think that's also why I'm happy, all things considered, with the opportunities I've had so far and hope to have as many in the future. I recently published in Nature Communications, but I'm not someone who has a lot of publications, let's just say I believe a lot in the ones I have. Sometimes I'm criticized for this; I'm told I take too long to write an article because I'm too ambitious for high-profile journals, the most prestigious ones, in short.

The truth is that I don't do this job just to do it, I do it because I truly want to contribute in some way, contribute something of my own, express my potential for something worthy.”



“That's a beautiful message, Demetrio, congratulations.”

“Thank you. But I want to say that I don't want to teach anyone about life, I simply told you how I see it, perhaps because by changing so many times, having to adapt so many times, I had to recognize the best in me, the good that is in me.

Vincenzo, aiming high is my way of not giving up who I am and what I can still be. It's my way of affirming my personality and my potential through my works, my life mission, what gives me strength with the people I talk to, what determines the influence I can sometimes have on others. Perhaps I still struggle with the fact that self-affirmation clashes with being willing to accept compromises.

And in any case, let's say once again, for me aiming high also means making sure that students feel that I am part of the process of change in which they are involved, as was the case with the demonstration for Palestine and the one for LGBTQIA+ groups. These are things I've always done and that I believe it's important to continue doing, even with the flyer I'm sticking on my office wall.

It's important to me that students feel comfortable, first and foremost, in a place where their ideas are well-received. If I were to have a more significant role, I would certainly work to bring in the voices of the students, who are an important part of the critical body of this society, of what's left of the critical body of this society.

Vincenzo, it's not like we get involved in politics at 20 because it's our time to do so, and then we grow up and stop. Maybe things change, but that humus remains within us, as does the desire to communicate, participate, and feel part of something bigger. The Sumud Flotilla left Barcelona yesterday, and I, who live there, wasn't there yesterday, and I was really disappointed, but then I said to myself, 'Oh well, I'll be there next time.' I'm not saying this because I think it's important for me to be there, but because I want to fully convey the meaning of what I draw from. I don't know if I'm clear."

“You are clear, Demetrio, very clear.”

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