

Working Hard and Laughing Loud

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When my friend Francesca Vipiana asked me to write an article for this column, I immediately agreed, driven by my natural impulse to embrace work-related opportunities. This request came four years ago, but unfortunate circumstances prevented me from doing it until now. As I sit down to write, Francesca advises me to share something valuable, especially for young women pursuing research in our field. I must admit that I feel a bit stuck, considering the previous amazing articles I saw in this very column.

While I don't consider my career extraordinary, I promised to write this article and share thoughts that have aided me along the way. I don't aim to set an example or be a model for anyone, but I hope my experiences and insights can resonate with some of you. I'll talk about the fortunate moments, key aspects of my career, unlucky situations I faced, and how I overcame them. Hopefully, my story can be useful and relatable to some of you. I'll do my best.

DECISIONS: BEING DETERMINED

Making decisions is one of the most difficult things we encounter in life despite our brains being well trained to make thousands of daily choices. Let me tell you how I made some of the initial decisions in my career. I am quite a determined person, a quality that has helped me a lot in my career.

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EDITOR'S NOTE

This contribution to the Women in Engineering column is authored by Eva Rajo Iglesias, a professor at the University Carlos III, Madrid, Spain. She described and analyzed her academic career, writing about fortunate moments, key aspects, and unlucky situations, giving insights on how a strong network of colleagues, friends, and mentors helped and supported her. Her experience and thoughts can be a great guide for young researchers to pursue a successful scientific career in the IEEE Antennas and Propagation Society.



Francesca Vipiana^{ID}

I became an engineer out of my love for math; during my time, studying telecommunication engineering was trending in Spain, and that explains my first choice. As for all my female colleagues from Southern Europe who have previously contributed to this column, I consider myself fortunate to have had amazing parents who placed a high value on education. They never questioned me about or suggested pursuing any other type of study. Hence, the decision to become an engineer was entirely my own, and I can confidently say that it was 100% my choice.

During my last year of the degree, I made the independent decision to pursue a Ph.D. without anyone else suggesting or convincing me to do it. Similar to choosing my university studies, this decision was crystal clear to me. I stood out as the only one among my university friends and graduating class who opted to do a Ph.D. and continue as a student for several more years. I was already living away from

home as I was studying at the University of Vigo. During the first year of my Ph.D., I wasn't even paid, but luckily, my family supported me in this decision. While my friends secured great jobs in the industry, I remained committed to the uncertain academic path.

I share this to emphasize that doing a Ph.D. was a tough and personal journey for me. I never tried to persuade anyone to pursue a Ph.D. because, in my opinion, it is a personal decision, and you must be certain about it. In my case, I took six years in total to do my Ph.D. After the first unpaid year, I had an opportunity to move to Madrid to do my Ph.D. with a job position as a teacher assistant at University Carlos III, and I moved without hesitation.

After completing a Ph.D. and transitioning into a true researcher, in my time, choosing to pursue a Ph.D. meant committing to a career in academia. However, the world has become more flexible, and nowadays, after obtaining a Ph.D., you have the option to remain

in research/academia or venture into industry. Even in Spain, you can secure a rewarding job in industry following your Ph.D. (my last two Ph.D. students are happily employed in Spanish companies designing antennas). When making this decision, it's crucial to be sincere with yourself. Sometimes, we tend to idealize academic careers, admiring the privileged lives of senior professors while simultaneously demonizing working in industry. But, as you know, life isn't just black or white; there are various shades in between. Each path has its own set of challenges and rewards, so weigh your options carefully and follow the path that aligns best with your passion, aspirations, and personal situation. I am sure I could have been happy in industry as well.

Embarking on an academic career, especially in the south of Europe, can be fraught with uncertainty and precariousness. It's essential to acknowledge that few academic journeys follow a linear path. As you take each step, trust your instincts and seek advice from those who care about you and understand the academic landscape. Their guidance can prove invaluable in navigating the challenges ahead. But anyway, always try to make your own decisions.

NETWORKING/COLLABORATIONS

Throughout my career, collaborations and networking have been essential for my survival and growth. Following difficult times with my original research group, I decided to create a small independent group. To continue my research, I established numerous permanent collaborations with other researchers. How did I manage to achieve this? By seizing every opportunity to move around and maintaining an open attitude. I actively pursued research periods in different universities, allowing me to build connections and establish fruitful partnerships. Conferences played a crucial role as well, enabling me to expand my network and foster collaborations with like-minded researchers. Beyond that, I continue to collaborate alongside several of my former Ph.D. students, maintaining strong ties even after their graduation.

The significance of moving and experiencing different cultures became evident

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to me already during my Erasmus of eight months in Toulouse, France. At that time, Erasmus opportunities were rare, but this enriching experience opened my mind in ways I couldn't have imagined (another great decision in my life). Since then, I moved to Madrid to do my Ph.D. (about microstrip patch antennas), and during my Ph.D., I spent some months in Nice, France.

After completing my Ph.D., I spent two months at the European Space Agency (The Netherlands) to begin my learning journey about periodic structures. Since 2004, I embarked on regular visits spanning seven years (two to five months each year) to the research group of Prof. Per-Simon Kildal at the Chalmers University of Technology in Sweden (Figure 1). The first time I visited Chalmers, I got a mobility scholarship from my university, and I got the suggestion to use it to visit Per-Simon as he was an expert in

artificial surfaces. I could never imagine that this decision would start a collaboration that would be instrumental in shaping my career. I still cannot believe how lucky I was to have the chance to collaborate with Per-Simon! I will give you more details about my experiences in Sweden in the following section of this article.

During my time at Chalmers, I built connections with researchers like Prof. Sipus from the University of Zagreb, Prof. Kishk from Concordia University, Prof. Ng Mou Kehn from National Chiao Tung University, and Prof. Valero from the Technical University of Valencia, all of whom were associated with the Chalmers group somehow. These collaborations have endured, contributing significantly to my career.

Just to mention other mobility actions throughout my career, for four months, I was at the University of Siena, Italy, with my good friend Prof. Stefano Maci in 2012, which was another incredible experience. His group is a dream for any researcher. Talented and super-kind people. That was another very lucky moment in my career. Then, I spent three months in 2016 at KTH, Sweden, alongside Prof. Oscar Quevedo-Teruel, who is an amazing researcher and was my very first Ph.D. student. More recently, I have begun a collaboration that I am certain will continue



FIGURE 1. With Prof. Per-Simon Kildal at EuCAP 2010 Rome.



FIGURE 2. One of my first conferences was IEEE AP-S 2002, San Antonio. Everyone takes a picture with Prof. Balanis at their first conference.



FIGURE 3. The IEEE AP-S Conference in San Diego 2008.



FIGURE 4. The EuCAP 2018 conference in London.

for many years with Dr. Francisco Pizarro from PUCV in Chile. I had the opportunity to spend two fantastic months in Valparaíso as part of this collaboration.

These international collaborations have been transformative, fostering growth and opportunities in my research endeavors. Embracing cultural diversity and mobility has undoubtedly shaped my career in profound ways. But how have I been able to make all these stays? By continuously looking for funding opportunities for mobility, and obviously, sacrificing my personal life many times. Here, the understanding, generosity, and support of my husband have been essential.

Returning to the topic of conferences, I cannot stress enough the importance of attending these events. Over the years, I've had the pleasure of meeting and forming strong bonds with researchers from my generation (many of them females), especially within Europe. These connections have led to a sisterhood, akin to being part of an "antenna family." We share incredible memories from more than two decades ago and truly cherish the time we spend together. You can see some of the pictures I am sharing from conferences over the years (Figures 2–4).

Meeting like-minded researchers, living through similar circumstances, and experiencing comparable emotions create a unique understanding among us. I can say that we resonate. So, my recommendation to you is to actively engage with other female researchers at conferences and not limit yourself to spending time only with your research group from home when you are attending a conference (Figures 5–7). Be open and connect with others, and even if the conferences aren't in exotic locations, try to be there. In my view, conferences offer a chance to form genuine friendships that can greatly contribute to your career.

By regularly attending the same conferences, you increase your chances of networking and building lasting relationships within the scientific community. Remember, these connections can be instrumental in enhancing your research journey and

opening doors to exciting opportunities. Embrace the power of networking and the sense of community that conferences can bring.

“WORKING HARD AND LAUGHING LOUD”

Returning to my experiences in Sweden, I used to concentrate all my teaching in Spain during the second semester of the academic year and travel to Sweden during the winters, which was quite challenging for a Spaniard, but my sole purpose was to learn. During my first three-month stay, I was immediately fascinated by Per-Simon and the way things worked in his group. I remember telling a colleague, “I have found my place in the world.” I meant it in a professional sense, and let me explain to you why.

At Per-Simon’s group, I worked tirelessly, even on weekends, but I also discovered the secret to doing successful research: enjoying what you do and never being in a hurry in research. I learned how vital it is to find joy and celebrate every little success in research. During my time at Chalmers, I recall the sound of sincere laughter echoing in the corridors. Equality, mutual support, generosity, and knowledge sharing were the cornerstones of the atmosphere at Chalmers. Everyone was treated well, regardless of their background or culture. My time there was undoubtedly the highlight of my research career, and it changed my perspective on how research should be conducted. I also realized that exceptional brilliant people can be kind and approachable.

Per-Simon was not only brilliant but also funny and enthusiastic, and he never wasted his time criticizing others’ work; he remained focused on his own projects. He was always available to anyone, including young researchers like me at the time, and I consider myself incredibly privileged for that experience. Today, I strive to replicate the lessons I learned at Chalmers with my Ph.D. students. Together, we laugh and try to enjoy the research process but always working hard. My goal is to be a supportive mentor and help them understand

Building a supportive and harmonious team can foster creativity, motivation, and a sense of belonging.

that comparing themselves to others is not productive.

Each of us faces different challenges and opportunities, and it’s crucial to find enthusiasm in the research we do. Instead of comparing ourselves to others,

we should seek motivation from successful individuals who inspire us on our unique research journey. Research and academia are not easy paths for almost anyone. You will be amazed at the challenges that even renowned researchers have faced and overcome on their journey to success.

RESONATING

Another guiding principle in my life as a senior researcher is recognizing the extraordinary privilege we have in academia: the possibility to choose whom we work with. In my opinion,



FIGURE 5. The EuCAP 2019 conference in Krakow.



FIGURE 6. The 2022 SYMAT COST meeting in Granada, Spain.

to be efficient at work, it's essential to resonate with your Ph.D. students and colleagues. Don't force yourself to collaborate with individuals who don't give you a positive feeling. It's simply a waste of time.

Instead, focus on conducting research with people who truly resonate with you. This lesson echoes what I learned at Chalmers about the importance of enjoying the research process. When you work with people you genuinely like, the fun and enthusiasm naturally follow, leading to significant progress in your research endeavors. Building a supportive and harmonious team can foster creativity, motivation, and a sense of belonging. Surround yourself with like-minded people who share your passion and vision and embrace the power of collaboration with those who resonate with you.

BEING A WOMAN: CHALLENGES

After reading other articles in this same corner, I have come to understand that many European women who have

written here share a common experience. We have been fortunate to have parents who highly valued education and supported our decision to become engineers and researchers. They never questioned our choices because we were women; instead, they encouraged us wholeheartedly. In that sense, we have to recognize that we have been privileged.

Throughout my career, I must admit that I have not felt overt discrimination for being a woman. However, I have faced comments and likely encountered more scrutiny than my male colleagues. While I am not entirely in favor of positive discrimination, I am aware of the benefits it can bring, though it may also lead to self-doubt and questioning. As a woman, I have experienced certain privileges in my professional life. I have been invited to participate in relevant initiatives and events for the sake of achieving gender balance, which is indeed a valuable opportunity. However, I have experienced myself that we tend to say "yes" to too many commitments, and this can lead to work

overload and overwhelming responsibilities. Additionally, the feeling of being perceived as being there "just because you are a woman" sometimes lingers, even though it may not reflect the actual reason for your participation.

Women, in general, often care deeply about what others think of us, and many of us, including myself, struggle with low self-confidence and imposter syndrome. It is surprising to find that even seemingly confident women share these experiences. Connecting with other women and sharing thoughts and feelings can be an eye-opening experience, and it helps us realize that we are not alone in these struggles.

RESILIENCE

Throughout your career, no doubt, there will be ups and downs. There will be lucky moments, but you can also face very negative circumstances. Personally, I was not prepared to face unprofessional behavior in academic or scientific societies, but it happened to me.

Unfortunately, I went through a traumatic experience that I would rather not delve into. Initially, I was unsure if I should mention it here, but I believe it is essential to share in the hope that it may help someone else. I became a victim of an abuse of power, leading to severe restrictions on my publishing opportunities. This unfair situation plunged me into darkness for three long years. The timing couldn't have been worse as it happened during the COVID pandemic, and the burden of social isolation was added to the problem. Additionally, my life was further devastated when cancer appeared and took away my father, one of my favorite people in the world, within just a few months.

This series of events left me shattered, but I was fortunate to receive immense support from my university, students, and colleagues in the antenna community while I felt abandoned by the scientific society. Despite the help, it was the worst period of my life. Slowly, with



FIGURE 7. A happy return to the EuCAP conference after the pandemic (2022, Madrid).

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millimeter-wave antenna arrays and metasurfaces for future wireless communications. Although my dream started at a small university in Korea, it has taken its first step into the wider world. To any young researchers hesitating at this very moment, I hope my story can provide you with courage and determination as you pursue your dreams.

SUMMARY

Throughout this article, I have shared my personal journey of becoming a professor, highlighting valuable lessons that can empower young researchers in their academic pursuits. By embracing our realities, setting optimal goals, and maintaining a positive mindset, we can overcome barriers and achieve success. Consistency and persistence play crucial roles in making progress, even when we are faced with personal and societal obstacles.

From my own experiences, I have emphasized the importance of staying committed to our studies and maintaining a rigorous schedule. Despite initial rejections and setbacks, unwavering determination and perseverance can ultimately lead to success.

As I look toward the future, my aspirations include achieving international recognition and expanding my research activities. By seizing opportunities for collaboration and showcasing high-quality research, we can make meaningful

contributions to our respective fields and pursue our dreams.

In summary, I hope that my story inspires young researchers, encouraging them to fearlessly pursue their aspirations. Success is within reach when we confront reality, set goals, and remain consistent in our efforts. Each aspiring researcher has the potential to make a significant impact and realize their desired dreams.

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the support of my family, friends, professional therapy, and the amazing people in the antenna community, I am starting to see the light again, but I will never be the same.

In academia and life, bad people exist, and unfortunate events can happen without warning. Becoming a victim is not something we can always avoid, exactly like in the real world. There is no magic recipe for avoiding such situations. However, having created my "antenna family" has been a lifeline. When things went

wrong, they were there to take care of me, providing the necessary support and understanding.

My hope is that sharing my story will serve as a reminder that bad things can happen, but with the right support system and resilience, we can gradually heal and find the strength to move forward. It is crucial to build a strong network of colleagues, friends, and mentors who can stand by us during difficult times and help us navigate the darkest moments.

As I conclude this article, I would like to express my heartfelt gratitude

to Francesca for encouraging me to write it. I am also taking this moment to extend my deepest thanks to all the people who have stood by me throughout these difficult years. You know who you are, and your support has meant the world to me.

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