

## ADVICE TO MID-CAREER RESEARCHERS

*We are starting a new series to provide advice to mid-career researchers. There are a number of programs that SIGMOD organizes for researchers at the beginning of their careers (PhD Symposium and the like) and senior people do not (or should not) need much help. There are considerable challenges for those who are about to transition from an early researcher to a more senior role. In academia, these are people who are about to get tenured that comes with starting to think of moving from shorter-term research objectives to longer-term ones. In industrial research, this corresponds to the transition from participating in projects to initiating and leading them. As a community we don't seem to talk about these challenges much. That is the gap this series attempts to fill. We will get the views of senior researchers from diverse backgrounds and diverse geographies. We will continue as long as we find original advice and the views are not repetitions.*

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## The Long and Winding Road to Mid-Career Academia

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I am extremely excited to contribute to this series and I would like to thank Tamer for giving me this great opportunity. When I started my PhD in Italy at the end of the nineties, it was still the time when you felt intimidated by your PhD advisor and, in general, by senior colleagues when you meet them at conferences. I did not imagine becoming one of them in a few years. Indeed, I remember that the first scientific event that I ever attended was the EDBT Summer School in La Baule-les-Pins (France)<sup>1</sup> in 1999. I was a first year PhD student at that time, and I was meticulously attending all the lectures, taking notes and working on them during my free time. I learned over the years that an equally important part of conferences are the social interactions, the networking activities and the hobnobbing. When a senior colleague pitches an idea to you, you can agree or not agree. It is time to fight back with proper arguments! All along during our careers, we strive to reach independent critical thinking.

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<sup>1</sup> For interested people, I amazingly found some pictures of the summer school on the Internet.

As long as you grow in your career from a fresh PhD student to a mid-career researcher and a senior researcher, you are on the right path for scientific independence. You have the power to decide which topics interest you, which collaborations you want to pursue, which students you want to hire, how to best supervise and mentor students and so on. The downside is that with time you become more in demand. The beauty of this independence process is that you focus on what you like, and you are more productive. It was my case since I started my research journey working on semi-structured data (all along my PhD, postdoc and a few more years after that) until I became a full professor in France in 2011. In the meanwhile, as soon as I approached the mid-career stage, I started working on a couple of new topics taking a certainly risky path. I began to be interested in data integration, which was a hot topic at the time (and still is). Data integration was also a topic broadly studied in the database community, but I decided to focus on novel aspects, such as user interventions and quality of the transformations. I decided to contact two senior colleagues to write a book on schema matching and mapping in the Data-Centric Series on Data management in 2011. The

book is a great collection of chapters with contributions from several colleagues in our community.

As soon as NoSQL databases started to become popular, I began to investigate problems around graph data management. My first PhD students on this topic were very productive, and I could quickly build several new scientific collaborations with other teams as well as industrial collaborations. As graphs are the cornerstone for data integration, I could also continue on my former topic and combine the two topics. As part of this process, I co-authored another book on querying graphs in the Synthesis Lectures on Data Management in 2018. Apart from classical topics, such as graph query evaluation and learning, schema discovery, graph repairs, I also actively participated in the discussions on standardization of languages for graph databases. The latest work with colleagues from both academia and industry in SIGMOD 2023 addresses the design of schema and key constraints for property graphs, as the basis of newly born standard query languages, such as GQL (2024) and SQL/PGQ (2023).

My first piece of advice to mid-career researchers is to avoid stagnation on a single topic and select at least a couple of new topics to work on. Working on a trendy topic is not necessarily the best choice. It is important to choose a topic on which you can leave an imprint and to develop what I call a “natural instinct” for what is interesting next. But this choice is also guided by your previous expertise and background, and you might need a lot of advice for choosing the right path.

**Striking the right balance between teaching and research.** You are now a mid-career researcher but you might not have reached a balance between research and teaching (there are also other daunting administrative tasks in academic life, but I am oversimplifying here). I work in the French academic system, where we have a fairly heavy teaching load and this can be detrimental for people who want to do top-notch research. My advice here is to get organized and find possible ways to moderate your teaching service. This is extremely difficult because you

have to show that you are a top researcher before being eligible for endowed research chairs and similar scientific accolades. It is the chicken and egg problem! From a practical viewpoint, it means that you have to be an equally good teacher and researcher for a few years and then get senior enough to have a lower teaching load. It was my case as soon as I got hired as a full professor – the university waived half of my teaching (2011-2013). Later on, I was on an endowed research Chair at INRIA (2018-2021). Lately, I have been nominated a Senior Member at the Institut Universitaire de France in Paris (2023-2028), a high distinction that recognizes top researchers across all disciplines in France. Now, you might appreciate why the road to mid-career academic success is long, winding and full of uncertainty!

**Coping with time management problems.** One important skill that we learn along the road is time management. When I see junior professors in my entourage, I often observe that they struggle with time management. This is due to the fact that as mid-career researchers and later as senior researchers, we have to juggle many tasks including research, teaching and service. The number of tasks exponentially grows (and at the moment I am writing this article I just received a new task from the VP of my university – I know that I should not have checked my email inbox!). How to cope with time management in an effective manner? My simple piece of advice here is to be extremely organized and to know how to prioritize activities that are the best to carry out at a given point in time. Working in batches is also a viable option with some round-robin scheduling. My working day is always like a puzzle in which eventually all pieces fit together.

**Going beyond your comfort zone.** You are a mid-career researcher and now you can settle down. You have your own research team, your own PhD students and postdocs as well as your well-earned research grants. If you have developed a research topic, and you start to be regarded as one of the top researchers in your area, this does not mean that you need to stop looking at other areas, whether they are subareas of data management or other areas in CS and even beyond CS. Keep training yourself by attending

online courses and webinars and always seek new ideas on your future research topics! This is the time when the fun starts.

**Nurturing research collaborations with other teams.**

Along these lines, do not be afraid to start new collaborations during your sabbatical leaves or just during short research visits or while networking at conferences. You are a researcher after all, and it is important to keep connections with people in the community who work on similar topics as yours or on rather different topics. Collaborating with others fosters interdisciplinarity and cross-fertilization. I can mention one of my experiences when I was co-organizing a Dagstuhl workshop on Big Graph Processing Systems in 2019. I convinced my co-organizers to involve people from the HPC community and this is one of the most successful Dagstuhl workshops I have ever organized. We jointly published a paper in CACM 2021 on the “Future is Big Graphs: A Community View on Graph Processing Systems”.

**Mentoring, mentoring, mentoring and being mentored.**

It is important to mentor young researchers. This is a relevant part of our job and it allows us to advise young people in our community. We are lucky that mentoring activities are nowadays organized in our main conferences (e.g. in SIGMOD and VLDB as part of the DEI initiatives) but you can also do it locally in your university and in your research team. Young researchers need a lot of help when they make crucial choices in their careers (industry vs. academia, a postdoc position vs. a job). As more experienced researchers, it is important to help them navigate the system. I always keep in touch with my former PhD students and postdocs and continue to mentor them all along their careers. Mentoring activities take time, but are also extremely rewarding!

As a mid-career researcher, you might also need actionable advice from your senior peers. Striving for excellence in research is not easy, and at any time during your career you might need help from a senior colleague. If you do not have a senior person in your team, you can contact people in other teams or abroad that you trust. I was lucky to be in

touch with senior people in our community. Their advice has been indispensable and key to my success.

**The importance of continuous education.**

Education is an important part of our job in academia as much as research. They are the two sides of the same coin. Within education (as well as within research), we have to address new unexpected challenges, such as the role of large language models. This leads us and especially mid-career researchers to reignite their educational and pedagogical skills and to work under the umbrella of this new technology with its pros and cons.

**Working on impactful things.**

As researchers, we always wish that our papers are highly cited and our work is well respected in the community. There is not a unique definition of what is a breakthrough in research, as this might lead to industrial impact, impact in other research areas and/or in multidisciplinary applications. My advice here is to always go deeper in a topic and strive for excellence. Data management is a great field as it unifies theory and practice and has several applications. I remember my first interdisciplinary grants in France with colleagues working in personalized medicine and bioinformatics. They had a lot of “data” problems to solve, and I was fascinated by them.

If you were not impactful as a junior researcher for some reason, this does not mean that you cannot be impactful in your mid-career path or even later. But it is important to not put too much pressure on yourself and to enjoy what you are doing.

**Summary.**

I started with reminiscences about the first scientific event I attended as a PhD student and about the fact that at that time senior researchers seemed out of reach (at least to me). Now, times are different and with social networks and other tools people keep in touch across continents on a regular basis. There are plenty of opportunities to meet senior people and ask their advice.

Concluding, be passionate about research and teaching, tackle a new challenge (e.g. write a book on your favorite

topic), strive for excellence, get organized, reach the right balance between teaching and research as you see fit, mentor young researchers in your team or elsewhere, participate in DEI programs, keep a lifelong connection with your PhD students and postdocs and help them in their future careers.

It is never too late to start new research collaborations and to be impactful, and now that you are a mid-career researcher you have acquired a lot of more experience!