Mentorship advice for new faculty (presented at a special session at the IEEE SMC 2025 conference)

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1 Shall you get a mentor?

Absolutely, why not have an additional help from some experience colleague. There is another good reason to ask for advice: if you follow this advice and something goes wrong, the person who gave you this advice will feel responsible and help you improve the situation.

2 How can you find a mentor?

Some universities have organized mentoring of young faculty, but if your university does not have such a program, just select some experienced colleague who you like, and ask for his/her advice. People like to give advice, it shows that someone respects their opinion – and it makes them feel good. It is not often that people complain about not getting any advice, it is much more frequent that people complain about getting a lot of unwanted advice.

This phenomenon can be traced to ancient times. For example, one of first books of Talmud, an ancient Jewish commentary on the Bible, has the following recommendation: "Get yourself a teacher, acquire yourself a friend". The meaning is that to have someone as a true friend, you need to help this person too – but a teacher you can get "for free".

3 What if you do not follow your mentor's advice?

OK, you got a mentor, this mentor gave you an advice, but what if you do not follow this advice? Will not the person who gave this advice be not happy?

Maybe. To avoid such situations, it is a good idea to have two (or even more) mentors. This way you can choose which advice to follow – and mentors will not be upset, since you cannot follow all their advices. And to get advice from two smart people is clearly better than from one of them.

At our university, we used to have a two-mentor system, when each new faculty member got two official mentors: one in his/her department, who understands research topics and who can help to succeed in research, and a second mentor from outside the new faculty's department, who can help navigate the human relations aspects of the job – and may give good advice the young faculty is not comfortable with something or someone in his/her own department, an advice that he/she may be reluctant to discuss with the in-department mentor.

4 What advice did I myself got from my mentors – in addition to very technical advice?

They gave me a lot of advice – for which I am very thankful. I just want to mention three advices that – as I see them now – were most important: two advices related to research and one social advice.

4.1 First research-related advice: have a plan B

Research-wise, the first important advice was to always have what Americans call Plan B. When you were working on your PhD, your adviser would remind you that you need to defend on time. Because of this, you should not focus exclusively on Most Important and Most Challenging World Problems – these problems can rarely be solved in 4 years, you should selected problems that are doable in 4 years. And if in addition to that, you prove something else – great.

Now that your PhD is over, you may be thinking: great, now is the time to finally focus on Most Important and Most Challenging World Problems. Not yet. You still need to show some results to get tenure in 6 years – and these problems can rarely be solved in 6 years. So, you need to have Plan B, you need to also work on some doable-in-6-years problems that will guarantee your success in a possible situation when you have not yet solve the Most Important Problem.

In Russia – where I am originally from – we learned this advice from history classes. Early 20 century revolutionary parties – that eventually succeeded in overthrowing the Tsarist regime – always had two programs: the program-minimum – describing what they absolutely needed to achieve in the next few years – and program-maximum – describing what they would like to achieve.

When an IEEE society plans a conference like this one, the organizers do not just propose one plan and one budget, they come up with at least two plans (and two budgets): for the pessimistic case when we will have fewer participants, and for the optimistic case, when we will have more participants.

Similarly, when a department looks for a new faculty member, its advertisement asks for a great researcher, excellent teacher, and a colleague who is

eager to do service – but such people are rare, so we end up hiring someone who is very good but not perfect – and we usually agree beforehand what are the minimal criteria that a new faculty must satisfy.

So, when you plan your research for the next few years, make two plans. In addition to the optimistic plan (in which you end up getting a Nobel Prize and world fame), you also need to have a realistic plan in which, by the end of the probational period, you will have enough good results to succeed.

4.2 Second research-related advice: do not forget real-life problems

Another important research-related advice is not to forget real-life problems and not to forget the interdisciplinary character of most real-world problems. To successfully solve these problems, you need to collaborate with people from other research areas. This need is natural for our IEEE society, with its emphasis on system and on cybernetics – both multidisciplinary research areas. However, in academia, we are divided into departments, sometimes forgetting that real-life problems require people from many disciplines.

But collaboration is important. For example, when Einstein tried to find the physics of space-time, he did not limit himself to physics, he teamed up with mathematicians to solve this problem. Now, it seems natural, but it was not natural at all in the early 20th century: for example, another Nobel-winning physicist Werner Heisenberg – of the Heisenberg Uncertainty Principle fame – spent a lot of time reinventing ... matrices. Such mathematics of not part of physics education and physics practice at that time.

In this interdisciplinary collaboration, you need to be careful: not all departments appreciate working on problems outside the department area. In this, your mentor(s) can advice.

4.3 Social advice: do not be too negative about the administration

The third important advice is not to be too negative about the administration.

Why are many young faculty have a negative view of the administration? This is easy to explain. Most scientists are not good communicators – just read research papers. We try and try, but our papers are still not easy to understand. It is only much later that textbook authors manage to describe these ideas in a clear way. There is even a half-joking saying that a quality of a researcher can be gauged by the number of badly written papers that this researcher authored.

Administrators – who are usually also scientists (or at least former scientists) – are no exception. They are not very good communicators in science, and most of them are not very good communicators in their administrative decisions either. This is especially true when a person just started his/her administrative career: this ability comes with experience.

As a result of this communication disconnect, administration's decisions – which often actually come after a thorough analysis of pros and cons – sound

imperfect and even wrong to faculty "in the trenches", to the people who usually do not know all the circumstances and all the limitations.

When I myself was a new faculty member, we younger colleagues thought that administrators sometimes make idiotic decisions. Later on, when some of my colleagues and friends became themselves department chairs, I realized, after talking to them, that chairs are actually making smart decisions – but the deans, they are sometimes acting like idiots. Then some of my friends became deans – shall I continue?

I wish I could, from the very beginning, understand that the vast majority of administrators have good intentions. Earlier this year, the newly elected President of the American Physical Society made exactly this claim, in his inaugural speech – that administrators – and that even political leaders – usually have good intentions (no matter what their opponents claim).

Yes, sometimes the administrators do not see all the negative side effects of their decisions – in this case we need to help them. We are all on the same side of the barricades, we all want further progress in science and engineering, we all want the best for the society, so let us all work together.