

The Leaky Pipe: Why Women Leave Engineering

In recent years, the U.S. microwave industry has put more emphasis on attracting and retaining women engineers. The Israeli industry faces many similar and yet some different issues.

In recent years, the Women in Microwaves—a subset of the IEEE Women in Engineering (WIE)—has created networking opportunities, recognized accomplished women in the industry, and delved into why women do not enter or stay in microwave engineering. Typically, much of this effort is put into events during Microwave Week, when the International Microwave Symposium is held. This year, a special session on Women in Engineering is also being held at the IEEE Conference on Microwaves, Communications, Antennas, Electronic Systems, and Bio-Medical Engineering (COMCAS), which takes place in Israel. I recently had a chance to talk with Hagit Messer, an endowed Professor at the School of Electrical Engineering, Tel Aviv University, about why she put together this event and the issues women in Israel in particular face that may cause them to leave engineering.



Hagit Messer

reasons. This is a problem particularly in Israel, where relatively many women go into engineering, do brilliant work, do well in their careers, but still opt to change careers a decade or so into their work lives. It should be noted that according to Intel, this “leaky pipe” issue affects other diverse populations beyond women.

NF: What do you think causes this phenomenon of the “leaky pipe?”

HM: I’m not certain, but based on my experience I can suggest some reasons. They are of course important ones, as no one would lightly throw away all that investment—their own and from the university and industry—after 10 or so years. The first would be family, as engineering is hard to do part-time—especially in a startup environment, where you’re often judged by the time you put in instead of what you accomplish. The second is that not all engineers feel fulfilled simply bringing more money to shareholders; they want to feel that they do more for people. Finally, women in particular will complain about the masculine culture. They complain that they have to raise their voices to be heard and if they don’t, they won’t be counted.

NF: What do you think are the biggest issues faced by efforts to bring and keep more women in engineering?

HM: Women in engineering are facing a three-pronged challenge:

1. Bringing girls/young women into STEM.
2. Breaking the glass ceiling by making sure women are promoted as men are.
3. Fixing the “leaky pipe,” which is a term for how we successfully bring young women in via STEM, succeed in having them get engineering degrees and subsequently jobs, but then lose them about 10 years later when they leave for various

NF: Do you think any of these issues are more pronounced in Israel?

HM: It is common in Israel for families to have more children, typically three or more. So that certainly is a factor. If you feel the tension of career versus family, many women are not comfortable choosing career. When faced with miss-

ing your child's "firsts," for example, writing code is not very fulfilling emotionally. Israel is also a bit unusual because its society isn't necessarily considered to be polite. You can criticize your coworkers openly, but that may make some people feel more pressured. It should be noted that engineers make good money—up to five times more than a teacher—, but still, successful women engineers choose teaching. And there is almost no unemployment in Israel.

NF: Are there any initiatives in Israel that focus on Women in Engineering?

HM: Yes, private initiatives, but most of them provide tools for women to be more like men, such as networking. I think it might work better to create a female culture at some companies, rather than help women fit into a male culture. Other initiatives have experienced women come in to mentor the younger women. Advantages like flexibility could keep a lot more women in engineering, but it's easier for established companies like Google, Microsoft, and Intel to provide that than it is for others.

NF: What are you most hoping to get out of the Women in Engineering event at IEEE COMCAS?

HM: The ultimate goal is to make team leaders, CEOs, etc. more aware of the experience women have in their groups. We have a panel of four women engineers to provide different points of view, which I hope will help us identify the issues preventing women from staying in engineering in Israel. One is a senior officer, so she can provide the management perspective. The second works at a high-demand company where she helped improve the situation for women in that company in various ways, eventually getting help and recognition from the CEO for those efforts. The next speaker chose a specific engineering job because she wanted to do meaningful work. The last panelist is one that left engineering, who can give her perspective on why she left and what could have prevented her from making that decision.

The event also will offer a talk from in the former head of HR at Microsoft Israel, who will address various efforts she has participated in regarding women in engineering. Sherry Hess from AWR will talk as well to give some international perspective. Finally, we will share the results from a survey we did, asking professional women if they were happy in engineering, why or why not, what changes would make them happier in their jobs, why they might think of leaving, and more.

NF: Thinking about your own engineering career, how did you get your start?

HM: Maybe from my father; he never had any gender bias. He was a self-made man, having come alone to Israel at 16 after losing his whole family in the Holocaust. He would say, "You can do whatever you want to do." So when I was serving

in the Israeli Army and working in the radar unit, I became interested in electronics. From there, I studied electrical engineering at university.

I was always interested in everything and, when you're an engineer, you can do so many things: research and development, teaching, management, and more. If you're, say, a social worker, you can work with people but not do engineering. I realized I wanted to have my degree in engineering and do various things in and related to that field.

NF: What are you working on these days?

HM: I'm actually getting involved in new startup with a different structure that's more focused on an environment that better fits women.

NF: I also understand you're doing some very interesting research to measure rainfall from the ground up using signal attenuation from records of telecom carriers. Can you describe this in more detail?

HM: A large part of the cellular backhaul network is based on microwave links, which are sensitive to changing conditions in the propagation channel and mostly weather. In 2005, we pioneered the suggestion to use existing measurements taken by standard network management systems for environmental monitoring. Our first paper was published in Science on May 2006. It received much attention because with this technology, data from widespread cellular networks can be used for accurate, high tempo-spatial resolution weather monitoring.

NF: How many students have participated in this weather monitoring to this point?

HM: Our research group is as unique as it is cross-disciplinary, with graduate students ranging from EE to eEarth sSciences. In any given time, we have about 10 members in the group. By now, we have had about 20 graduates, published more than 50 papers with manuscript citations, and do excellent research collaboration with other groups studying and applying our technology.

NF: Anything else you want to add?

HM: During my long career, which also includes high-level academic administrative positions, I was active in promoting women to science and engineering. I strongly believe that having and retaining more women in engineering is not only fair and good for them; it is also highly beneficial to science and engineering. Women do think differently than men. They therefore bring new ideas and innovative solutions. I think that my innovative idea for transforming commercial microwave links into virtual weather stations is one such example.