Women's History Month Special Article: Interview with "Professor Ozlem Kilic"

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***Abstract* –** The month of March is Women's History Month. We all have heard and know that only a small percentage of electrical engineers are female. This percentage is even smaller for those that are experts in the field of applied computational electromagnetics. In this article, we are focusing on Dr. Ozlem Kilic, one of the well-known and established intellectuals in the field of computational electromagnetics. Dr. Kilic not only has been a role model for young students as an excellent researcher, a technical leader, and a prolific writer in this field, but also she has extensive experience in teaching and has taken many academic administration roles.

***Keywords* –** Women in STEM, women in applied computational electromagnetics.

I. INTRODUCTION

By the year 2021, the Applied Computational Electromagnetics Society (ACES) has elected 42 fellows from its members, and only one of them is female. Professor **Ozlem Kilic** was promoted to a fellow member in 2016. Additionally, she took leading roles at ACES. She was a member of the ACES Board of Directors between 2009 and 2012 and the Founding Editor-in-Chief for *ACES Express Journal*. She received the ACES Recognition Award in 2018 for her contributions. She is a remarkable researcher and educator. I got a chance to communicate with her and ask her a few questions. This article summarizes our conversation. I am sure it will be inspiring for our society members.

II. BIOGRAPHY

Professor Ozlem Kilic is currently the Associate Dean for Academic and Student Affairs with the Tickle College of Engineering, University of Tennessee Knoxville (UTK), Knoxville, TN, USA (Figure 1). In this role, she oversees a variety of the college's programs, including undergraduate and graduate curricula, diversity, study abroad, advising, student recruitment, scholarship and fellowships, and the Heath Integrated Business and Engineering program.

Before joining UTK, Professor Kilic served as the Associate Dean of the College of Engineering at the Catholic University of America in Washington, DC, USA. Before that, she was the Chair of the Electrical Engineering and Computer Science Department at the same university for two consecutive terms. Professor Kilic is a fellow of the Applied Computational Electromagnetic Society and an elected council member for the Maryland Clean Energy Center. She has served as Chair and Vice-Chair of the International Union of Radio Scientists (URSI) Commission A, and as an advisory committee member of IEEE Antennas and Propagation Society. She has authored more than 135 peer-reviewed articles.

Dr. Kilic earned the bachelor's degree from Istanbul's Bogazici University in 1989, and the master's and doctorate degrees from George Washington University in 1991, and 1996, respectively, all in electrical engineering.

Fig. 1. Professor Kilic in Tickle College of Engineering, the University of Tennessee Knoxville.

III. Questions and Answers (Q & A)

Q: Tell me about your career path. Why did you get interested in electromagnetics?

A: I love math (having a mathematician dad may have something to do with it). I love the ability that math pro-

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vides to model, understand, and explain complex concepts in physics in short and elegant ways. Something that may take more than two pages of writing using words can be explained with just one short equation. So, when I saw the four elegant equations of Maxwell, you can imagine, it was in love at first sight! Volumes of books are continuously being written to capture what they mean.

Q: How did you become involved in the ACES?

A: I remember my first ACES meeting in Niagara Falls. I had started my academic career a few years prior. My research was heavily focused on hardware-accelerated electromagnetics modeling of electrically large problems. The ACES conference's relatively small size was very attractive as it enabled close interactions.

Q: Why do you think Applied Computational Electromagnetics is an important area of research and development?

A: The ability to model a scenario requires an in-depth understanding of the concept. Once that is achieved, one can apply the concept to many different scenarios without having to be in the scene, opening up tremendous opportunities for investigation and learning at the tips of a "return" button. Electromagnetic modeling is fascinating as our devices and scenarios get more intricate, our dimensions shrink, and the complexity of our problems increases. We can compute things faster and faster, enabling "real-time" investigation and understanding of such complex scenarios.

Q: How do you see yourself as a role model for the young girls who are interested in STEM, engineering, and electromagnetics?

A: It is always helpful to see people you can relate to in positions you aspire to. It is even more helpful to have people you relate to in positions you would not even consider. If a young girl can see in me a potential for her future and a glimmer of motivation to pursue STEM, I consider myself lucky. Engineering remains a career that is not accessible by the female population. But we need to be aware that it is not just women who can be role models to aspiring young women to pursue STEM careers. After all, it was men who were doing inspiring work that motivated me, starting with my father. Later in my career, it was my male colleagues and role models that supported me to get where I am today. I see myself as a role model to our male students in the field so that, in the future, they support women as colleagues and leaders.

Q: Tell me about the type of challenges you had to face and how you overcame them.

A: I guess my challenges relate to being a minority in most of the settings my career took me. It was from my first day in college onward that I was almost always either the only or one of the few women in the room. It inadvertently brings pressure that mistakes can easily be attributed to the gender that is likely seen as one the most defining features of oneself in such settings. There could also be a tendency that by being different, one may not always receive the benefit of social interactions that can enhance collegial relationships at work. These drive one to be a perfectionist and strive for the best to ensure success. I see this trait in all my female colleagues. However, challenges do not necessarily determine a negative outcome, and everybody deals with them. We all just need to focus on what matters most and not lose sight of our ultimate goals. The path does not always have to be, and never is, the same for everyone. Also, at each turning point, I like to look back and make sure I am helping others to avoid or overcome the challenges I have had to face.

Q: What are the topics you are working on now and why do you see them challenging and worth attention.

A: I am in an administrative role now, and one of my highest priorities is making engineering education accessible and attainable. Being at a land-grant institution has been wonderful as it has allowed me to look back and help others to avoid or overcome the challenges I faced. I oversee UTK Tickle College of Engineering's student success programs as part of my role as the Associate Dean. My office serves as a hub to connect our faculty and their research to support healthy pathways to an engineering degree at UTK (Figure 2).

Fig. 2. Professor Kilic giving a talk to young students.

Q: Any word of advice to the young researchers that are in the early stages of their careers?

A: Have fun and make time to build relationships on your campus and in your professional societies as you work very hard on your research. Step out of your comfort zones at every chance. Do not forget to engage "unlikely" research partners from other disciplines either as the bigger problems we need to solve involve us all.

IV. CONCLUSION

It is always inspiring for me to hear from leaders in the field, especially from a fellow female engineer and professor. Finally, I invite you to watch the video by Professor Kilic that was created for NIMBioS and is available on YouTube [1].

REFERENCES

[1] O. Kilic, One girl's journey in engineering – Pave your own path!, available online: https://www.youtube.com/watch?v=2FzYlLJT_pk&ab_channel=NIMBioS.

Sima Noghanian received the B.Sc. degree in electrical engineering from the Sharif University of Technology, Tehran, Iran, and the M.Sc. and Ph.D. degrees, both in electrical engineering, from the University of Manitoba, Winnipeg, Canada. She is the chair of ACES Communication and Membership Committee and serves as an Associate Editor for *ACES Journal*. She received a Postdoctoral Fellowship from the Natural Sciences and Engineering Research Council of Canada in 2002, which she took at the University of Waterloo. She was a researcher with YottaYotta Corporation, Edmonton, AB, Canada. She was an Assistant Professor with the Department of Electrical Engineering, Sharif University of Technology, from 2002 to 2003. From 2003 to 2008, she was an Assistant Professor with the Department of Electrical and Computer Engineering, University of Manitoba, Winnipeg, MB, Canada. She was an Assistant/Associate Professor and the Director of the Applied Electromagnetic and Antenna Engineering Laboratory in the Department of Electrical Engineering, University of North Dakota, Grand Forks, ND, USA, from 2008 to 2018. She also served as the Electrical Engineering Department Chair from 2014 to 2016 at the University of North Dakota. From 2018 to 2019, she was a visiting Professor with the Department of Electrical and Computer Engineering, San Diego State University, San Diego, CA, USA. She was an Electromagnetic Application Engineer with Phoenix Analysis and Design Technologies Inc. (PADT) (2019-2020), and a Principal Antenna Design Engineering with Wafer LLC (2020-2021). She is currently a Principal Antenna Design Engineer with CommScope, Sunnyvale, CA, USA. Her research interests include MIMO antennas for wireless communications, wearable and implanted antennas, 3D printed antennas, wireless power transfer, microwave imaging, and wireless channel modeling.