Interview

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Interview With Prof. Gordana Jovanovic Dolecek

Prof. Dolecek's Short Bio

Prof. Gordana Jovanovic Dolecek was awarded the 2024 IEEE Circuits and Systems Society John Choma Education Award. She received the B.Sc. and Ph.D. degrees from the University of Sarajevo, Bosnia and Herzegovina, and the M.Sc. degree from the University of Beograd, Serbia. She was a Professor with the Faculty of Electrical Engineering, University of Sarajevo, from 1969 to 1993. From 1993 to 1995, she worked as a Researcher at the Institute Mihajlo Pupin, Belgrade, Serbia. In 1995, she joined the Institute INAOE, Department for Electronics, Puebla, Mexico, where she works as a Full Professor. She was a Visiting Researcher with UCSB, Santa Barbara, USA, in 2001, 2002, and 2006, with SDSU San Diego, USA, in 2008 and 2009, and with UCLA, Los Angeles, USA, in 2015 and 2016. She is the author/co-author of over 80 journals and 400 conference papers. She is the author of the textbook "Random Signals and Processes Primer with MATLAB," Springer NY: 2013, and editor of book "Advances in Multirate Systems," Springer, NY, 2017, and "Multirate Systems: Design and Applications," IGP, Hershey, USA, 2001. She is a member of the Mexican Academy of Sciences, SNI of Mexico, and a Life Senior Member of IEEE.

Question 1: How did you feel when you learnt that you were selected for the CASS John Choma Education award?

Prof. Dolecek: Being selected for the award can evoke emotions, such as pride, excitement, gratitude, and perhaps nervousness about the new challenges ahead. It is a significant achievement and recognition of one's hard work and potential.

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Question 2: What role has the Circuits and Systems Society played in your Career?

Prof. Dolecek: The IEEE Circuits and Systems Society (CASS) has played a significant role in my professional Career. I will mention some of them:

- **Professional Development**: Through conferences, workshops, and seminars, CASS offers opportunities for continuous learning and staying updated with the latest advancements in the field. I assisted in many CASS events like IEEE ISCAS, IEEE MWSCAS, and IEEE LASCAS.
- **Leadership Opportunities**: Members can develop management and leadership skills by volunteering in the society's activities or taking up leader ship roles. As a TPC member, I regularly participated in those events, organizing special sessions and tutorials. I am a DSP CASS Committee member for ISCAS conferences. I also was a reviewer for many CAS conferences and journals. I served as Associate Editor for IEEE Transactions on Circuits and Systems I and II and IEEE CAS Magazine. I am a Senior Associate Editor for the journal IEEE Transactions on Circuits and Systems II.
- **Recognition and Awards**: CASS offers various awards and recognitions for outstanding contributions, which can enhance one's professional reputation and credibility. I received recognition as a Best Associate Editor of the IEEE Transactions on Circuits and Systems I in 2022 and 2020–2021 and of the IEEE Transactions on Circuits and Systems II in 2024. I am very proud to be elected as a recipient of the valuable IEEE CASS John Choma Award in 2024.
- **Publishing and Research**: CASS publishes several high-impact journals and magazines, allowing researchers to publish their work and gain recognition. I published my research results in the flag-

ship CASS journals IEEE Transactions on Circuits and Systems I and II. I also contributed to the IEEE CAS Magazine.

- **Networking Opportunities**: CAS provides a platform to connect with professionals, researchers, and industry leaders, which can open doors to collaborations, mentorship, and job opportunities. Those opportunities were very important in my academic work through collaborations with Prof. Sanjit K. Mitra, UC Santa Barbara, USA; Prof. Jose Silva Martinez, Texas A&M, USA; Prof. Jose M. de la Rosa, IMSE Sevilla, Spain; and Prof. Ljiljana Trajkovic, Simon Fraser University, Canada.
- **Educational Resources**: Access to a wealth of technical papers, tutorials, and online courses helped me to expand my knowledge and skills.

Question 3: What inspired your initial research in this field?

Prof. Dolecek: The inspiration for my initial research in the circuits and systems field stems from various sources, which, individually or in combination, embarked my research in the circuits and systems field.

- **Academic Influence**: Exposure to inspirational professors, coursework, and scholarly projects during undergraduate or graduate studies sparked my interest in the field.
- **Mentorship and Guidance**: Influential advisors who provide guidance, support, and inspiration impacted my research direction.
- **Technological Challenges**: My first research inspired my desire to solve specific problems or improve existing technologies, such as enhancing communication systems or advancing signal processing techniques.
- **Personal Interests**: A passion for electronics, gadgets, and how things work can drive an individual to explore and innovate within the circuits and systems domain.
- **Curiosity and Innovation**: A natural curiosity and a drive to innovate and push the boundaries of what is possible in electronics and systems design.
- **Collaborative Opportunities**: Collaborative projects with peers, research institutions like the University of Belgrade, or industry partners like "Energoinvest" opened up new research avenues and inspired my initial investigations.

Question 4: Who were your early mentors?

Prof. Dolecek: I learned much from my early mentors: Prof. Brana Drazenovic, University of Sarajevo, Bosnia; Prof. Radoslav Horvat, Prof. Mirko Milic, and Prof. Lilja Milic, University of Belgrade, Serbia.

However, in my later professional work, I was fortunate to learn a lot from Prof. Sanjit Mitra, UCSB, USA, and Prof. Jose Silva Martinez, Texas A&M, USA.

Question 5: What are some contributions that led to your winning the award?

Prof. Dolecek: Winning an award in education, particularly in the field of circuits and systems, such as the CASS John Choma award, involved my several key contributions, making a strong case for receiving such a prestigious award:

- **Innovative Teaching Methods**: Implementing new and effective teaching strategies that enhance student learning and engagement.
- **Research and Publications**: Conduct significant research in education and publish findings contributing to the understanding of effective teaching and learning practices in circuits and systems in educational journals and conferences, as well as in the CASS conferences.
- **Educational Outreach**: Engaging in activities that promote STEM education in the broader Community, such as organizing tutorials, seminars, and short courses worldwide.
- **Educational Resources**: Developing textbooks, online courses, and other educational resources widely used and respected in the academic Community. Particularly, I developed various online courses for Techonline that were among the most popular in the international scholarly Community. My textbook, "Random Signals and Processes Primer with MATLAB," published by Springer in 2018, has approximately 50k downloads in its electronic format.
- **Mentorship**: Providing exceptional mentorship to students, helping them to succeed academically and professionally. The former includes guiding research projects, offering career advice, and supporting personal development.
- **Student Success**: Demonstrating a track record of student success, including high graduation rates, student awards, and successful careers.
- **Professional Development**: Actively participating in and contributing to professional organizations, conferences, and educational committees to advance the field of education.
- **Curriculum Development**: Creating and refining a curriculum that is up-to-date with the latest advancements in the field, ensuring that students gain relevant and comprehensive knowledge.

Question 6: What were the barriers to the problems with respect to education?

Prof. Dolecek: Typical barriers I confronted are the following:

- **Limited Resources**: My institution often has constrained budgets, making it difficult to acquire up-to-date lab equipment, software, and other teaching materials necessary for effective instruction.
- **Keeping Up With Technological Advances**: The rapid pace of technological change in circuits and systems can make it challenging to keep the curriculum current and relevant. Staying updated requires continuous learning and adaptation, which is challenging considering limited resources.
- **Resistance to Change**: Sometimes, there is resistance from faculty or administration when trying to implement new teaching methods or curriculum changes. Established practices and traditions in my institution are hard to shift.
- **Time Constraints**: Different duties and research obligations sometimes leave a limited time to develop and implement new educational initiatives.
- **Student Diversity**: Catering to a diverse student body with varying prior knowledge, learning styles, and educational backgrounds requires significant effort and adaptability in teaching approaches.
- **Assessment Challenges**: Developing fair and comprehensive assessment methods that accurately measure student understanding and skills can be difficult, especially in a field with both theoretical and practical components.
- **Funding for Research**: Securing funding for educational research projects is difficult, particularly for projects that may not have immediate, tangible outcomes.
- **Balancing Theory and Practice**: Finding the right balance between theoretical knowledge and practical application in the curriculum requires careful planning and continuous adjustment.

Question 7: What are some of the approaches that you developed that were able to overcome those barriers?

Prof. Dolecek: To overcome the barriers faced in improving education in circuits and systems, educators and researchers can develop and implement various innovative approaches to address the challenges and obstacles in the education of circuits and systems, leading to improved student outcomes and a more dynamic and relevant educational experience. I will mention the following approaches that I consider the most important:

- **Securing Projects and Funding**: I was applying for government funding agency CONAHCYT projects to obtain necessary resources and funding for modern lab equipment and teaching materials.
- **Continuous Professional Development**: Engaging in ongoing learning to stay updated with technological advances, such as attending conferences, participating in workshops, and staying on a sabbatical stay in different prestigious universities such as UCSB, SDSU and UCLA, and collaborating with some eminent professors from the USA, Europe and Asia.
- **Active Learning Techniques**: Utilizing active learning strategies and problem-based learning to increase student engagement and understanding.
- **Mentorship Programs**: Establish mentorship programs by sending my students to experienced faculty at several universities to guide students, provide support, and enhance their educational experience.
- **Diversity and Inclusion Initiatives**: Implement programs such as scholarships and outreach programs to increase diversity and inclusion in the field.
- **Leveraging Technology**: Using simulation software, virtual labs, and online collaboration tools to provide hands-on experience even when physical resources are limited.

Question 8: What are the impacts of your education initiatives?

Prof. Dolecek: The results in education, particularly in the field of circuits and systems, can have a wide range of impactful outcomes contributing to the advancement of both teaching practices and student outcomes in circuits and systems.

In my case, I should mention the following:

- **Enhanced Learning Outcomes**: Improved teaching methods and curriculum designs resulted in better understanding and retention of complex concepts, higher student performance, and deeper comprehension.
- **Increased Student Engagement**: Innovative teaching strategies, such as active learning and interactive technologies, make learning more engaging and enjoyable, leading to higher attendance and participation rates.
- **Improved Critical Thinking and Problem-Solving Skills**: Research-driven educational practices fostered critical thinking and problem-solving skills essential for success in circuits and systems.
- **Professional Development for Educators**: Research findings can provide valuable insights for

educators, helping them to refine their teaching practices, stay updated with the latest educational trends, and continuously improve their professional skills.

- **Curriculum Innovations**: I developed many new courses, modules, and learning materials that better address the needs of students and the state of the art.
- **Higher Student Retention Rates**: Effective teaching methods and supportive educational environments ensured that more students completed their programs successfully.
- **Student Confidence and Independence**: Educational practices emphasizing active learning and hands-on experience boosted students' confidence and independence, preparing them for lifelong learning and career adaptability.
- **Global Impact**: Research results shared through publications, conferences, and collaborations have a global impact, influencing educational practices and standards in other institutions and countries.

Question 9: Please cite references to some papers on education?

Prof. Dolecek: See [1], [2], [3], [4], [5], [6], [7], [8], [9], [10].

Question 10: What advice would you give to current graduate students and young professionals in academia and industry for furthering their research and/or Career?

Prof. Dolecek: Here are some pieces of advice for current graduate students and young professionals in academia and industry to enhance their research capabilities, advance their careers, and make meaningful contributions to their fields of study or industry sectors:

- Set Clear Goals for research and career path.
- Stay updated with the latest developments in your field through reading journals, attending conferences, and taking courses or workshops.
- Build a Network with peers, professors, professionals in industry, and researchers in your field.
- Find mentors who can provide guidance, support, and advice based on their experience in academia or industry.
- Aim to publish your research in reputable journals and present at conferences to increase visibility and credibility in your field.
- Be open to peer, mentor, and colleague feedback to improve your research and professional skills.
- Be proactive in seeking research projects, collaborations, internships, and funding opportunities.
- Stay resilient, learn from challenges, and keep progressing towards your goals.
- Contribute to the Community through activities that contribute to your academic or professional Community, such as organizing events, volunteering, or participating in professional organizations.
- Cultivate skills such as communication, teamwork, project management, and leadership, which are valuable in academia and industry.
- Maintain high ethical standards in your research and professional conduct, respect intellectual property rights, and promote integrity in your work.
- Maintain a healthy work-life balance.

Question 11: Anything else you would like to include?

Prof. Dolecek: I want to sincerely thank all the people involved in my nomination for this prestigious award and members of the Award Committee who recognized my work in CASS education and research.

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