IEEE
Advancing Technology
for Humanity

BARRY SHOOP
Candidate for 2015 IEEE President-Elect

Barry Shoop received the Ph.D. in Electrical Engineering from Stanford University. He is Department Head of Electrical Engineering and Computer Science at the U.S. Military Academy at West Point, responsible for an academic department with 79 faculty and staff serving over 2300 students annually. He is a Fellow of the IEEE, OSA and SPIE. He received the 2008 OSA Robert E. Hopkins Leadership Award, the 2013 SPIE Educator Award, and the 2013 IEEE Haraden Pratt Award with the citation that reads: "For vision and leadership in improving IEEE operations and governance, and for building a stronger foundation for IEEE's strategic future."

Earlier Dr. Shoop was a satellite communication engineer responsible for design and installation of a high-capacity, world-wide digital communication network, and also the Chief Technology Officer (CTO) for a $4.5B organization addressing the Improvised Explosive Device (IED) challenge, worldwide. He holds a patent on photonic analog-to-digital conversion, and has authored over 150 archival publications as well as 8 books and book chapters. He is a licensed Professional Engineer in Virginia.

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1. There is a difference between an individual contributor and a technical leader, and part of the difference has to do with understanding the value of empowering others to do better things rather than working alone. What caused you to move from individual contributor (practitioner) to technical leader?

In my early years as an engineer, I took great pleasure and pride in developing technological solutions to problems. There is tremendous satisfaction in being able to go from concept to hardware – creating things that previously did not exist – to solve problems. As I became more senior, I moved into positions where I managed other technical people and I was able to lead others to solve larger and more complex problems – and therefore the overall impact was greater. I followed the same path in my professional society volunteer leadership positions – first working on individual projects myself and later, in more senior volunteer leadership positions, leading other volunteers. Again, the impact was greater and therefore the satisfaction was also

greater. As Vice-President of Member and Geographic Activities (MGA), I served as a Corporate Officer of the IEEE leading a global network of volunteers serving the professional needs of over 430,000 members in over 190 countries worldwide through a network of 10 regions, 333 local sections and 2,350 student branches. In the IEEE, ultimately it's about making a contribution and making my professional society better – and serving in leadership positions allows me to make a larger impact. It is also incredibly rewarding to help others succeed – effective leadership ultimately sets the conditions for others to succeed.

2. Which is your leading experience that you consider personally most remarkable?

I have been an active IEEE volunteer leader for over 20 years and bring diverse leadership experience from three other professional societies and a career spanning over 34 years. My IEEE experiences provide me with comprehensive knowledge of the operations of the IEEE – across the breadth of the Institute. I am a collaborative leader - I listen to people, understand the issues and have a demonstrated record of bringing diverse groups to consensus. I have led major change in the IEEE by focusing on the member, developing products for the practitioner, and improving our strategic positioning. I have a vision, a plan and the experience to lead IEEE to be the professional society of choice for technical professionals around the world.

3. How would you motivate IEEE members to envision and embrace leadership values of "Advancing technology for Humanity", so far from engineers education?

I believe that one of the most important applications of technology is to improve people's lives. For those in underserved regions of the world, it can save lives, alleviate suffering, and maintain human dignity. Broadly speaking it can benefit society and the human condition. In all regions of the world it can improve the quality of life. Helping our members understand how technology can be used to solve important problems and provide solutions to clean water, reliable energy, food production, health care, education and ultimately industrialization and employment is an important first step. Seeing the impact of a water purification system on a village in South Africa or improvements in

education resulting from the use of technology in Bogota can motivate and inspire our members to become engaged and thereby embrace IEEE's vision of Advancing Technology for Humanity.

4. Please share with us who they are your heroes and role models, and why or how they guided you.

Mentors and role models play a critical role in the personal and professional development of individuals. It was through mentorship that I originally got into the field of electronics and electrical engineering. My father was my first mentor – I grew-up in rural Pennsylvania in the early 1970s – the era of muscle cars. In high school, I was convinced that my destiny was to be an automotive mechanic. My father, who spent a career as a truck driver, instead recommended the field of electronics – while not a formally educated man, his appetite for reading led him to the conclusion that this was the field of the future. I listened to his rationale and sage counsel and the rest is history. As I reflect on my career there always seemed to be someone looking out for me – whether a teacher, guidance counselor, professor, peer or a senior leader – there was always someone who thought I was capable of more than I thought of myself. Several were role models who I aspired to be like. Most were not formal mentorship relationships but instead were simply knowledgeable and experienced individuals willing to take time to share their experiences and the courage to provide honest feedback about my strengths and weaknesses. I became a better engineer, leader and human being as a result of these mentorship engagements.

5. Dealing with big organizations is never easy, so succeeding in accomplishments leaves interesting lessons learned. Pease tell us about your happiest experience, and also please tell us the kind of (IEEE) problems you went through.

As Vice-President of Member and Geographic Activities, I developed the Regional Geographic Strategy, a data-driven methodology and prioritized strategy to engage in mature, under-represented and emerging markets, world-wide. This methodology focuses on unique circumstances and commonality of the local geographic region to improve membership value and drive recruitment and retention. One of the major successes of this strategy is the Metropolitan Area Workshop which is a unique collaboration between multiple IEEE organizational units to provide professional education and certification that will equip members to compete in an increasingly challenging job market. The goal of these workshops is to increase member engagement and provide value to IEEE members and their local community by providing career assistance, professional networking and education on technology changes. The target audience is the practitioner – practicing engineers and technical professionals who are innovators, have a desire to learn more, and/or are in career transition or considering a career change. The content of these

workshops addresses emerging technologies that are in demand within the local geographic area. Example topics have included Cloud Computing, Smart Grid, Software Engineering, Mobile Application Development and Electric Vehicle Technology. The biggest lesson learned in this particular example is that change in large organizations is slow and difficult – and requires persistence and tremendous personal engagement to succeed.

6. Which are the strengths and weakness you identify in R9, and your ideas about focusing them.

In all of my travels throughout Latin America I am struck first and foremost by the passion of the people. Work hard and play hard is a fitting description. Our IEEE volunteers in Region 9 are no exception – absolutely dedicated volunteers who are committed to improving the IEEE and supporting our members. Region 9 is also fortunate to have student members who are energetic, very active and willing to work on IEEE projects. Region 9 is suffering from the same downturn in membership that many other IEEE Regions are experiencing. Local Section vitality and improving IEEE value at the local level is key. Activities like the Metropolitan Area Workshop which provides professional education and certification to help members compete in an increasingly challenging job market. The content of these workshops addresses emerging technologies that are in demand within the local geographic area. These have been a huge success – well attended and with high satisfaction and attracting new members. Another challenge is that there is a lack of continuity in the leadership of IEEE's Sections, Chapters and Student Branches. I have also seen a lack of collaboration between the Sections and Chapters and the Student Branches in Region 9 – this is important to bring the student's new ideas and vitality to the Sections and Chapters and to provide the role models and mentors to the students for their professional development and to develop IEEE's future leaders. Finally, IEEE is not well known or valued among practitioners in Latin America. Here too I think the Metropolitan Area Workshop could serve as a model. The target audience for these workshops is practicing engineers and technical professionals who are innovators, have a desire to learn more or are in career transition or considering a career change. By supporting our practicing members we support our industry partners and demonstrate IEEE's relevance to both.

7. Which are the strengths and weakness you identify in IEEE globally, and your ideas about focusing them.

I believe our greatest strength is our members - their technological expertise and breadth, their love for an organization that has served them well, and their willingness to serve it as volunteers. Our reputation for excellence is another important strength. Our greatest weakness is that we are slow to respond to the changing world we live in. We must adapt faster to emerging

technologies, to the changing professional and career needs of our members, and to a world in which technology is a thoroughly global enterprise. Our vision for the future, "Advancing Technology for Humanity," tells our story. We must enable our members to fulfill it.

8. As Elected President, what is the very first thing you would do?

Election as IEEE President-Elect results in a three-year commitment – the first year as President-Elect, the second as President and the third as Past-President. Upon being elected, I intend to begin work immediately. As IEEE President-Elect, my very first priority is to begin setting the conditions to deliver on my campaign platform changes– increasing IEEE's value, developing an IEEE for the 21st Century and building a more adaptive and innovative IEEE. In this way, during my year as IEEE President, I will have already built the foundation to effectively implement the necessary changes to make these goals a reality – for our members, our profession and the public. In my usual collaborative leadership approach, I will reach-out and build diverse and expert teams to understand the challenges and ultimately address these changes – to further improve our professional society and build a strong foundation for IEEE's strategic future.

9. As Elected President, what is the long term specific objective that keeps you awake at night?

I worry most about my professional society – IEEE – becoming irrelevant and extinct. IEEE is a very large and complex organization that requires significant effort to change. There are many examples of corporate extinction resulting from disruptive technologies and innovations. Looking for trends and emerging technologies is very important for a technology-oriented organization like IEEE. Wayne Gretzky, the famous hockey player, once said of his success: "I skate to where the puck is going to be, not where it has been." It's about leading the target – being innovative and creative and looking for potential disruptions before they occur.

Innovation is both a technological and a human enterprise: one which IEEE is uniquely positioned to exploit. In order to identify and respond to potentially disruptive innovations, we must promote a culture that encourages innovation and risk taking. IEEE can benefit from the addition of a "skunkworks" or innovation engine that proactively identifies disruptions and innovations. I will foster an environment of collaboration and innovation across the entirety of the IEEE and provide the mechanism to more quickly move into new technical areas, adopt new engagement technologies and modalities and ultimately lead change rather than follow.

10. How would you like to be remembered?

I would like to be remembered as the IEEE President

who: (1) finally created a positive value proposition for practitioners and industry, (2) created a more adaptive and innovative IEEE and (3) strengthened and improved the IEEE and set it on a course for future success.

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FRED MINTZER
Candidate for 2015 IEEE President-Elect

Fred Mintzer received a BSEE from Rutgers and a PhD from Princeton. He was employed at IBM's Watson Research Center from 1978 until 2013. Beginning in the mid 1980s, he managed a team that developed new technologies for image-based digital libraries and validated them in projects with museums and libraries that included the Vatican Library, Russia's Hermitage Museum, and the Egyptian Museum in Cairo. These projects won numerous awards. From 2005 until 2013, he was the Program Director for IBM's Blue Gene Watson facility, which included the world's second fastest computer in 2005. He has authored over 25 patents and 50 papers, and was twice named an IBM Research Master Inventor. An IEEE Life Fellow, he has been President of the IEEE Signal Processing Society, Division IX Director, and Vice President of Technical Activities. While VP of TAB, he helped shift TAB's emphasis from its products to inspiring, fostering, and empowering its technical communities – and created new offerings to support them. You can find more at his site: www.fredmintzer.net.

1. There is a difference between an individual contributor and a technical leader, and part of the difference has to do with understanding the value of empowering others to do better things rather than working alone. What caused you to move from individual contributor (practitioner) to technical leader?

I was never satisfied just being a participant in a group that lacked direction and seemed headed for disappointing results; I would step in to help remedy its problems. Others would step in to help me. To move matters forward, I often began by working with the group to form a team vision. I encourage all members to participate and make a point of acknowledging team member's contributions. Team member's feelings of accomplishment encourage them to participate and grow. My past teams' encouragement of me has inspired me to continue and grow in leadership roles.

2. Which is your leading experience that you consider personally most remarkable?

In my professional career with IBM, l led a number of digital library projects with extraordinary museums and libraries that included the National Gallery of Art (USA), the Hermitage Museum, and the Egyptian Museum in Cairo. I became involved because of their technical needs. Over time, many thousands of people viewed the award-winning content they displayed – enjoying the art, planning visits, learning about history from original sources, and learning about their own cultural heritage. Touching the lives of so many people, even in a small way, is a life-changing experience.

3. How would you motivate IEEE members to envision and embrace leadership values of "Advancing technology for Humanity", so far from engineers education?

I believe many of our members are already motivated to advance technology for humanity. It is part of their inner selves. We do not need to motivate them. What we need to do is to create opportunities for them to participate in humanitarian projects and support them. That support includes creating an ecosystem within which new humanitarian technologies can be developed and deployed. It also includes creating an ecosystem to provide long-term support for these projects. The people benefitting from them depend on them; we can't let them down.

4. Please share with us who they are your heroes and role models, and why or how they guided you.

I have learned important lessons from many mentors – too many to mention. All taught by example. My first manager in industry, a person of great personal integrity, taught me the value of treating everyone with dignity and respect. My PhD thesis advisor, Bede Liu, encouraged his students to have high professional standards, be inclusive, and contribute to society; he was an inspiration to all of his students. John Cocke, an A.M. Turing Award winner, taught me the value of listening to others' ideas.

5. Dealing with big organizations is never easy, so succeeding in accomplishments leaves interesting lessons learned. Pease tell us about your happiest experience, and also please tell us the kind of (IEEE) problems you went through.

When I was VP of Technical Activities, I advocated a three-pronged strategy for IEEE Open Access publishing to TAB. This was very controversial, as it had elements that posed real risk to TAB, individual Societies, and the

IEEE. As the motion approached a vote, many spoke passionately against it and it seemed destined to fail. Then, a number of my TAB colleagues rose to support it – even though that seemed a very unpopular position. They used all the arguments they could muster. The motion narrowly passed and is bearing fruit today. I was especially proud to see my colleagues step up, take an unpopular position, and fight for the strategy we had jointly developed. Their courage has been an inspiration to me.

6. Which are the strengths and weakness you identify in R9, and your ideas about focusing them.

Region 9 has an abundance of talent, passion, and young professionals. Furthermore, it has enjoyed very strong leadership that brought it to its current position. But, R9 seems uncertain about what to undertake to move forward. If R9 can identify the right opportunities, and execute them, it could have a truly great future. I think R9 would benefit from having one or more collaborative hands-on projects, within the Region, that would bring its members together. The Smart Cities project, in Guadalajara, could be one such project. A Metro Area Workshop, within the Region, could be another.

7. Which are with us the strengths and weakness you identify in IEEE globally, and your ideas about focusing them.

The IEEE is blessed with many wonderful volunteers and staff. They are skilled, dedicated, and generous in donating their time. But the IEEE often finds it difficult to organize itself into effective teams that tackle the great problems of the day.

Part of the problem is turning a group of people into a functioning team. IEEE groups are often geographically dispersed and have difficulty meeting, communicating, engaging in dialogue and establishing common goals. Being able to better engage in group dialogue is essential to moving forward. I have been a strong supporter of the Professional Productivity and Collaboration tools, in part to increase the effectiveness of our interactions.

Another part of the problem is a lack of focus. I always liked to start with a mission statement for the organizations I managed in industry. Each IEEE organization should ask itself: What is our mission? How will we fulfill it? What should we ignore because it is outside of our mission? If people understand the mission, and its motivations, they are often happy to contribute.

8. As Elected President, what is the very first thing you would do?

I have always considered this a tricky question, as I live in hope that others might begin to pursue the items on my agenda before I take office. However, I do think promoting our profession is an important and often-neglected task - which will need continued attention for years to come. Engineers, and other tech professionals, are the innovators that solve the world's problems. They create economic growth. Yet, they so seldom hear this message verbalized that they do not know it or feel it. I would remind them, early and often, of the awesome impact that our profession has had.

9. As Elected President, what is the long term specific objective that keeps you awake at night?

There are many other organizations now creating new services to attract our members to them. I worry that our members will lose patience with the IEEE because it does not provide enough opportunities for them to pursue their personal and professional goals - and will leave us to form communities elsewhere. It is our members that give the IEEE the power to do awesome things. There is no substitute for them.

10. How would you like to be remembered?

Member interactions within our IEEE communities are at the core of the IEEE. I would like to be remembered as the IEEE President who did much to reinvigorate those interactions and communities – which in turn reinvigorated IEEE service to the communities beyond our walls.

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