



## Sharing Signal Processing with the World

I am writing this editorial for the March issue of *IEEE Signal Processing Magazine* (*SPM*) as 2014 comes to a close. My son's elementary school class just learned about the Jewish holiday of Hanukkah, the Muslim holiday of Ramadan, and the African-American celebration of Kwanzaa. This was in addition to the Thanksgiving and Christmas holidays that students are already keenly aware of. The school encourages parents to share any major holidays that their families celebrate as part of a cultural education for global citizenship. I volunteered to teach my son's class about the Lunar New Year celebrated by Chinese and several other Asian ethnic groups. Indeed, wherever we are and whatever ethnic roots we have, we are all proud of our cultural heritage. Through celebrations, not only do we enjoy this important time with our families and friends, but more importantly, we pass the cultural assets onto the next generation and share our cultures with the world.

This pride and desire to share are also common in our professional lives. Many professional groups, including the IEEE, have public outreach efforts to raise awareness of their (respective) professions and to attract more young people to join. One recent high-profile effort is CODE.org, which aims at expanding participation in computer science by making it available in elementary, middle, and high schools (known as K–12). With hands-on participation by celebrities and even U.S. President Barack Obama, this nonprofit organization developed accessible means to demystify computer programming. Within just a year from its launch, CODE.org reportedly prepared 3,000 new teachers in K–12 schools, brought an introductory course to

4 million students in 90,000 classrooms, and had tens of millions of people try an hour of programming. Even my son in elementary school proudly brought home a certificate that declared he completed an hour of coding!

This is one of many successful efforts by the computer science community in bringing excitement and the “cool factor” to the public as well as in attracting funding agencies' support. What can we learn from their efforts to advocate our field, i.e., to explain what signal processing is and to share the far-reaching contributions of signal processing with the world?

The leadership of the IEEE Signal Processing Society (SPS) has been working on this for a number of years. The most recent effort is an outreach video series led by SPS President-Elect Rabab Ward. The first video is now available on YouTube and shows the ubiquitous contributions of signal processing in our everyday life [1]. This 2-minute video uses multimedia to visualize “Signal Processing Inside,” a notion coined in the September 2004 editorial by SPS Past President K.J. Ray Liu (who was editor-in-chief of *SPM* at the time). Check it out, and please share this cool video with your schools, colleagues, friends, and families.

Now comes the harder part: how can we go further to explain in accessible terms and engaging styles what signals and signal processing are? Published over a decade ago, the book *Engineering Our Digital Future: The Infinity Project* by Orsak et al. offered a unique curriculum for high school students and college freshmen to learn about digital technologies. Authored by active volunteers in the SPS community, it covered the creation, storage, and communications of various modalities of signals. Since then, digital cameras, broadband communications, and online platforms have become affordable

and ubiquitous to everyone including kids and senior citizens. These advances have lowered the entry point for the general public to relate and appreciate signal processing technologies, but perhaps not through a systematic curriculum and hundreds of textbook pages.

Could and should *SPM*—known for its fine tutorials—fill in this gap to bring short stand-alone tutorials accessible to a broader audience (in addition to serving its traditional readership)? Such articles may supplement overview videos to raise awareness and the visibility of signal processing; they might serve as a bridge to invite interested students, teachers, and professionals to explore in-depth articles in the magazine (as well as the SigView online tutorials highlighted by SPS President Alex Acero in the January 2015 issue of *SPM*).

To quote Nobel Laureate Richard Feynman, the author of *The Feynman Lectures on Physics*, “If you can't explain something to a six-year-old, you really don't understand it yourself.” Perhaps six-year-old readers are on the other extreme from the expert audience to which many of our authors are accustomed. As a compromise, how about explaining signal processing to a sixth grader? I invite you, our readers, to join our editorial team for this exercise, as we explore new opportunities to share signal processing with the world.

### REFERENCES

- [1] IEEE SPS. “What is signal processing?” [Online]. Available: <https://www.youtube.com/watch?v=EErkgr1MWw0>
- [2] G. C. Orsak, S. L. Wood, S. C. Douglas, D. C. Muson, J. R. Treichler, R. A. Athale, and M. W. Yoder, *Engineering Our Digital Future: The Infinity Project*. Englewood Cliffs, NJ: Prentice Hall, 2003.