Michael Polley, for leadership in multimedia chipset architectures and mobile camera technologies.

Daniel Povey, for contributions to acoustic modeling for speech recognition.

James Preisig, for contributions to underwater acoustic communication channel modeling, signal processing, and performance prediction.

Miguel Raul D. Rodrigues, for contributions to multimodal data processing and foundations of reliable and secure communications.

Stephanie Schuckers, for contributions in biometric recognition systems.

Gonzalo Seco-Granados, for contributions to signal processing for global navigation satellite systems, and 5G localization systems.

Anthony Man-Cho So, for contributions to optimization in signal processing and communications.

Houbing Song, for contributions to big data analytics and integration of AI with the Internet of Things.

Changho Suh, for contributions to interference management and distributed storage codes.

Olav Tirkkonen, for contributions in the theory and practice of wireless communications technology and standards.

Xiaoyu Wang, for contributions to video analysis technologies for embedded systems.

Xin Wang, for outstanding contributions to wireless localization and dynamic resource allocation in broadband mobile networks.

Shinji Watanabe, for contributions to speech recognition technology.

Stefan A. Werner, for contributions to in-band full-duplex wireless communication systems and selective data-reuse online learning.

Jason D. Williams, for contributions to the theory and practice of machine-learning-based spoken dialogue systems.

Brendt Wohlberg, for contributions to computational imaging and sparse representations.

Shui Yu, for contributions to cybersecurity and privacy.

Yao Zhao, for contributions to image/video analysis and multimedia content protection.

Yongxing Zhou, for contributions to MIMO beamforming codebooks and smart spectrum access in wireless networks.

Chengqing Zong, for contributions to machine translation and natural language processing.

2022 IEEE Signal Processing Society Awards

The IEEE Signal Processing Society (SPS) congratulates the following members who will receive the Society's prestigious awards during ICASSP 2023.

Richard Baraniuk

The Norbert Wiener Society Award honors outstanding technical contributions in a field within the scope of the SPS and outstanding leadership within that field. The Norbert Wiener Society Award includes a plaque, a certificate, and a monetary award of US$2,500. It is the highest-level award bestowed by the SPS. This year's recipient is Richard Baraniuk, "for fundamental contributions to sparsity-based signal processing and pioneering broad dissemination of open educational resources."

Nicholas Sidiropoulos

The Claude Shannon–Harry Nyquist Technical Achievement Award honors a person who, over a period of years, has made outstanding technical contributions to theory and/or practice in technical areas within the scope of the Society, as demonstrated by publications, patents, and a recognized impact in this field. The prize for the award is US$1,500, a plaque, and a certificate. The recipients of the Claude Shannon–Harry Nyquist Technical Achievement Award are Nicholas Sidiropoulos, "for exemplary contributions to tensor decomposition, beamforming, and spectral analysis" and

Arnold Lee Swindlehurst

Arnold Lee Swindlehurst, "for contributions to multiuser and multiantenna communications and sensor array signal processing."

H. Vincent Poor

The Carl Friedrich Gauss Education Award honors educators who have made pioneering and significant contributions to signal processing education.

Judging is based on a career of meritorious achievement in signal processing education as exemplified by the writing of scholarly books and texts, course materials, and papers about education; inspirational and innovative teaching; creativity in the development of new curricula and methodology. The award comprises a plaque, a monetary award of US$1,500, and a certificate. The recipient of the Signal Processing Society Carl Friedrich Gauss Education Award is H. Vincent Poor, "for outstanding contributions to education and mentoring in statistical signal processing and wireless communications."

Ahmed Tewfik

Tulay Adali

The Leo L. Beranek Meritorious Service Award was presented this year to Ahmed Tewfik and Tulay Adali, "for exemplary service to and leadership in the Signal Processing Society." The award comprises a plaque and a certificate; judging is based on dedication, effort, and contributions to the Society.


Xuedong Huang

The Amar G. Bose Industrial Leader Award recognizes an industry business or technical leader whose leadership has resulted in major and outstanding advances or new directions using signal processing technologies within the scope of the Society. This award is for executive leadership resulting in major advances and new directions using signal processing in a business area. The prize is US$1,500, a plaque, and a certificate. The recipient of the Amar G. Bose Industrial Leader Award is Xuedong Huang, "for contributions to speech recognition and industrial leadership in artificial intelligence."


Ivan Tashev

The Industrial Innovation Award is presented this year to Ivan Tashev, "for outstanding contributions to microphone array and speech enhancement systems." The Industrial Innovation Award recognizes an individual or team at any level who were industry employees whose technical contributions have resulted in significant advances using signal processing technologies within the scope of the Society. Selection is based on major industrial accomplishments, standards, deployment of important processes or products, and so on that are of substantial benefit to the public, use signal processing technologies, and are visible beyond the company or institution where the contribution was made. The award is open to individuals at any level who were industry employees who played a significant role in the technical contribution at the time of the accomplishments being recognized. The prize includes US$1,500 per awardee (up to a maximum of US$4,500 per award), a plaque, and a certificate.
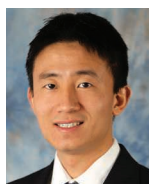
Mingyi Hong

The Pierre-Simon Laplace Early Career Technical Achievement Award honors an individual who, over a period of years in his/her early career, made significant technical contributions to theory and/or practice in technical areas within the scope of the Society, as demonstrated by publications, patents, and a recognized impact on the field, including but not limited to a standard, product, or technology trend. The award comprises a plaque, a monetary award of US$1,500, and a certificate. The recipient of the Pierre-Simon Laplace Early Career Technical Achievement Award is Mingyi Hong, "for contributions to nonconvex, distributed and learning-based optimization for signal processing."

Elvin Isufi

Geethu Joseph
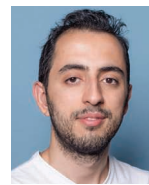
The Best Ph.D. Dissertation Award recognizes relevant signal processing doctoral work that stimulates further research in the field. The award consists of a monetary award of US$1,500 and a certificate. The recipients of the Best Ph.D. Dissertation Award are Elvin Isufi and Geethu Joseph.

Sarath S

The Meritorious Regional/Chapter Service Award honors the outstanding contributions of any member of the Society to regional activities of the SPS. Judging is based on dedication, effort, and contributions made to activities aimed at promoting the technical and educational activities of the SPS in one specific Region/Chapter as well as its local membership participation. The award comprises a plaque and a certificate. The recipient of the Meritorious Regional/Chapter Service Award is Sarath S., "for leadership and outstanding contributions as a volunteer and mentor at Section and Regional levels."

Six Best Paper Awards were awarded, honoring the author(s) of a paper of exceptional merit dealing with a subject related to the Society's technical scope and appearing in one of the Society's transactions, irrespective of the author's age. The prize is US$500 per author (up to a maximum of US$1,500 per award) and a certificate. Eligibility is based on a six-year window preceding the year of election, and judging is based on general quality, originality, subject matter, and timeliness. Up to six Best Paper Awards may be presented each year. This year, the awardees are

■ Morten Kolbæk, Dong Yu, Zheng-Hua Tan, and Jesper Jensen, "Multitalker Speech Separation With Utterance-Level Permutation

Invariant Training of Deep Recurrent Neural Networks," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, October 2017.

- Haoran Sun, Xiangyi Chen, Qingjiang Shi, Mingyi Hong, Xiao Fu, and Nicholas D. Sidiropoulos, "Learning to Optimize: Training Deep Neural Networks for Interference Management," *IEEE Transactions on Signal Processing*, October 2018.
- Fernando Gama, Joan Bruna, and Alejandro Ribeiro for "Stability Properties of Graph Neural Networks", *IEEE Transactions on Signal Processing*, September 2020.
- Stanley H. Chan, Xiran Wang, and Omar A. Elgendy, "Plug-and-Play ADMM for Image Restoration: Fixed-Point Convergence and Applications," *IEEE Transactions on Computational Imaging*, January 2017.
- David I Shuman, Pierre Vandergheynst, Daniel Kressner, and Pascal Frossard, "Distributed Signal Processing via Chebyshev Polynomial Approximation," *IEEE Transactions on Signal and Information Processing over Networks*," December 2018.
- Kang Wei, Jun Li, Ming Ding, Chuan Ma, Howard H. Yang, Farokhi Farhad, Shi Jin, Tony Q. S. Quek, and H. Vincent Poor, "Federated Learning With Differential Privacy: Algorithms and Performance Analysis," *IEEE Transactions on Information Forensics and Security*, April 2020.

The Donald G. Fink Overview Paper Award honors the author(s) of a journal article of broad interest that has had substantial impact over several years on a subject related to the Society's technical scope. A paper considered for the award should present an overview of a method or theory with technical depth and application perspective. It should have a multiyear record of impact and also be relevant to current researchers and/or practitioners. The prize consists of US$500 per author (up to a maximum of US$1,500 per award) and a certificate. This year, the Donald G. Fink Overview Paper Award recipients are Nicholas D. Sidiropoulos, Lieven De Lathauwer, Xiao Fu, Kejun Huang, Evangelos E. Papalexakis, and Christos Faloutsos, for "Tensor Decomposition for Signal Processing and Machine Learning," *IEEE Transactions on Signal Processing*, July 2017.

The IEEE Signal Processing Letters Best Paper Award honors the author(s) of a letter article of exceptional merit and broad interest on a subject related to the Society's technical scope and appearing in *IEEE Signal Processing Letters*. The prize consists of US$500 per author (up to a maximum of US$1,500 per award) and a certificate. To be eligible for consideration, an article must have appeared in *IEEE Signal Processing Letters* in an issue predating the Spring Awards Board meeting by five years (typically held in conjunction with ICASSP). Judging is based on technical novelty, research significance, and the quality and effectiveness in presenting subjects in an area of high impact to the Society's members. The recipient of the IEEE Signal Processing Letters Best Paper Award is Lorenzo Vangelista, for "Frequency Shift Chirp Modulation: The LoRa Modulation," *IEEE Signal Processing Letters*, December 2017.

The IEEE Signal Processing Magazine Best Column Award honors the author(s) of a column of exceptional merit and broad interest on a subject related to the Society's technical scope and appearing in the Society's magazine. The prize consists of US$500 per author (up to a maximum of US$1,500 per award) and a certificate. In the event that there are more than three authors, the maximum prize is divided equally among all authors, each of whom receives a certificate. This year, the IEEE Signal Processing Magazine Best Column Award recipients are Dong Yu and Li Deng, for the article "Deep Learning and Its Applications to Signal and Information Processing [Exploratory DSP]," published in the January 2011 issue of *IEEE Signal Processing Magazine*.

The IEEE Signal Processing Magazine Best Paper Award honors the author(s) of an article of exceptional merit and broad interest on a subject related to the Society's technical scope and appearing in the Society's magazine. The prize includes US$500 per author (up to a maximum of US$1,500 per award) and a certificate. In the event that there are more than three authors, the maximum prize is divided equally among all authors, each of whom receives a certificate. This year, the IEEE Signal Processing Magazine Best Paper Award recipients are Geoffrey Hinton, Li Deng, Dong Yu, George E. Dahl, Abdelrahman Mohamed, Navdeep Jaitly, Andrew Senior, Vincent Vanhoucke, Patrick Nguyen, Tara N. Sainath, and Brian Kingsbury, for the article "Deep Neural Networks for Acoustic Modeling in Speech Recognition: The Shared Views of Four Research Groups," published in the November 2012 issue of *IEEE Signal Processing Magazine*.

The Sustained Impact Paper Award honors the author(s) of a journal article of broad interest that has had sustained impact over many years on a subject related to the Society's technical scope. The prize consists of US$500 per author (up to a maximum of US$1,500 per award) and a certificate. In the event that there are more than three authors, the maximum prize is divided equally among all authors, each of whom receives a certificate. To be eligible for consideration, an article must have appeared in one of the SPS transactions or in *Journal of Selected Topics in Signal Processing* in an issue predating the Spring Awards Board meeting by at least 10 years (typically held in conjunction with ICASSP). This year, the Sustained Impact Paper Award recipients are Petre Stoica and Arye Nehorai, for "MUSIC, Maximum Likelihood, and Cramér–Rao Bound," published in *IEEE Transactions on Acoustics, Speech, and Signal Processing*, May 1989.

The Young Author Best Paper Award honors the author(s) of an especially meritorious paper dealing with a subject related to the Society's technical scope and appearing in one of the Society's transactions and who, upon date of submission of the paper, is younger

than 30. The prize is US$500 per author (up to a maximum of US$1,500 per award) and a certificate. Eligibility is based on a four-year window preceding the year of election, and judging is based on general quality, originality, subject matter, and timeliness. Two Young Author Best Paper Awards are being presented this year:

- Ashutosh Pandey for the paper coauthored with DeLiang Wang, "A New Framework for CNN-Based Speech Enhancement in the Time Domain," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, July 2019.
- Qiuqiang Kong and Turab Iqbal for the paper coauthored with Yin Cao, Yuxuan Wang, Wenwu Wang, and Mark D. Plumbley, "PANNs: Large-Scale Pretrained Audio Neural Networks for Audio Pattern Recognition," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, October 2020.

SPS members receive 2023 IEEE awards

The IEEE James L. Flanagan Speech and Audio Processing Technical Field Award will be presented to Alexander Waibel, "for pioneering contributions to spoken language translation and supporting technologies."

The IEEE Fourier Award for Signal Processing will be presented to Rabab Kreidieh Ward, "for outstanding contributions to advancing signal processing techniques and their practical applications, and for technical leadership."

IEEE has announced the recipients of the 2023 IEEE medals, which are the highest-honor awards it presents. The medals will be given at the 2023 IEEE Honors Ceremony. Two SPS members have been awarded an IEEE medal for 2023:

- The IEEE Jack S. Kilby Signal Processing Medal for outstanding achievements in signal processing will be presented to José M.F. Moura, "for contributions to theory and practice of statistical, graph, and distributed signal processing."
- The IEEE James H. Mulligan, Jr. Education Medal for outstanding contributions to education will be presented to James J. Truchard, "for the development of LabVIEW and establishing worldwide programs to enhance hands-on learning in laboratories and classrooms."

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FROM THE EDITOR *(continued from page 3)*

tips and tricks to decrease the number of additions per output sample in a cascaded integrator-comb multistage decimation filter. Two "Lecture Notes" focus on simple signal processing examples for understanding graph convolutional neural networks [A4] and making more explainable deep learning [A5]. Although these two articles use examples related to a simple linear filtering, for which we can wonder, what is the interest in using a nonlinear model, I think that these articles are interesting from a didactic point of view. Especially, in [A5], the same data (related to a two- or three-taps filter) are trained with four different neural architectures, all very simple. Although after training the different architectures achieve good fit of the filter, the explainability is not possible despite the network simplicity. Due to the black-box nature of the networks, even simple (six weights and three neurons for three of them), discussion clearly shows the impossibility of relating the weights of the network to the physical parameters of the filter. In the last part, the author suggests what is called a system-centric philosophy, which, in fact, suggests the use of some steps based on prior knowledge of the system to learn. This is exactly the same philosophy as the one supported in all the articles of the special issue on "Physics-Driven Machine Learning for Computational Imaging."

I wish everyone an enjoyable and rewarding read.

Appendix: Related Articles

[A1] J. Shenouda and W. U. Bajwa, "A guide to computational reproducibility in signal processing and machine learning," *IEEE Signal Process. Mag.*, vol. 40, no. 2, pp. 141–151, Mar. 2023, doi: 10.1109/MSP.2022.3217659.

[A2] B. Wen, S. Ravishankar, Z. Zhao, R. Giryes, and J. C. Ye, "Physics-driven machine learning for computational imaging: Part 2," *IEEE Signal Process. Mag.*, vol. 40, no. 2, pp. 13–15, Mar. 2023, doi: 10.1109/MSP.2023.3236492.

[A3] G. J. Dolecek, "Update on the CIC multistage decimation filter with a minimum number of additions per output sample (APOS): Can we still decrease the number of APOS?" *IEEE Signal Process. Mag.*, vol. 40, no. 2, pp. 151–154, Mar. 2023, doi: 10.1109/MSP.2022.3216720.

[A4] L. Stanković and D. Mandic, "Understanding the basis of graph convolutional neural networks via an intuitive matched filtering approach," *IEEE Signal Process. Mag.*, vol. 40, no. 2, pp. 155–165, Mar. 2023, doi: 10.1109/MSP.2022.3207304.

[A5] M. Narwaria, "Explainable machine learning – The importance of a system-centric perspective," *IEEE Signal Process. Mag.*, vol. 40, no. 2, pp. 165–172, Mar. 2023, doi: 10.1109/MSP.2022.3211368.

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[1] C. Jutten, "Scientific integrity: A duty for researchers [From the Editor]," *IEEE Signal Process. Mag.*, vol. 39, no. 6, pp. 3–84, Nov. 2022, doi: 10.1109/MSP.2022.3198298.

[2] National Academies of Sciences, Engineering, and Medicine et al., *Reproducibility and Replicability in Science*. Washington, DC, USA: National Academy Press, 2019. [Online]. Available: https://www.ncbi.nlm.nih.gov/books/NBK547532/

[3] M. Baker, "1,500 scientists lift the lid on reproducibility," *Nature*, vol. 533, no. 7604, pp. 452–454, May 2016, doi: 10.1038/533452a.

[4] S. Bernardi, M. Famelis, J.-M. Jézéquel, R. Mirandola, D. Perez Palacin, F. A. C. Polack, and C. Trubiani, "Living with uncertainty in model-based development," in *Composing Model-Based Analysis Tools*, R. Heinrich, F. Durán, C. Talcott, and S. Zschaler, Eds. Cham, Switzerland: Springer-Verlag, 2021, pp. 159–185.

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[6] R. Botvinik-Nezer et al., "Variability in the analysis of a single neuroimaging dataset by many teams," *Nature*, vol. 582, no. 7810, pp. 84–88, Jun. 2020, doi: 10.1038/s41586-020-2314-9.

[7] T. Glatard et al., "Reproducibility of neuroimaging analyses across operating systems," *Frontiers Neuroinformatics*, vol. 9, Apr. 2015, Art. no. 12, doi: 10.3389/fninf.2015.00012.

[8] E. H. Gronenschild, P. Habets, H. I. L. Jacobs, R. Mengelers, N. Rozendaal, J. van Os, and M. Marcelis, "The effects of FreeSurfer version, workstation type, and Macintosh operating system version on anatomical volume and cortical thickness measurements," *PLoS One*, vol. 7, no. 6, Jun. 2012, Art. no. e38234, doi: 10.1371/journal.pone.0038234.

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