From the Editor-in-Chief

DECEMBER 2019

Michael Rice

This last column for 2019 is devoted to the M. Barry Carlton Award. The M. Barry Carlton Award acknowledges what is judged to be the best paper in the IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS (TAES). To help identify and assess which TAES paper is best, the Carlton Award considers papers published four years earlier in TAES. As such, this year's Carlton Award is the 2015 M. Barry Carlton Award.

The award was established in 1958 after the early death of M. Barry Carlton in an air accident in 1957. The award is a means to honor a man who had dedicated much of his life to promoting the reliability of communications equipment, especially that relating to air transportation. It is one of the IEEE's oldest awards and supports a wonderful tradition of excellence.

It is my great pleasure to announce that the winner for 2015 is Jason Williams for his paper entitled "Marginal Multi-Bernoulli Filters: RFS Derivation of MHT, JIPDA, and Association-Based MeMBer." This paper appeared in the June/July issue of TAES. Random finite set (RFS) methods are used in statistical inference problems in which the variables of interest or the observations form finite sets. RFS methods apply to multiple-target tracking problems where the number of targets is unknown, the measurements are unordered, and measurement-to-target correspondence (data association) is unknown. In this paper, Williams derives a form of the full Bayes RFS filter and shows that the RFS filter comprises an alternate derivation to some well-known techniques. Further, he identifies an implicit data association in the derivation and shows that approximations to the data association produce both alternate derivations of existing techniques and possible improvements of those techniques.

The paper was nominated by the AESS Publications team and endorsed by Florian Meyer and Stefano Coraluppi. Dr. Meyer finds this paper to be "an outstanding and highly innovative paper" that is "clearly organized, comprehensive yet concise, and very carefully written. The presentation and style are excellent and the mathematical analysis is groundbreaking." Dr. Coraluppi writes that this paper, "provides the essential mathematical approximations leading to the highly promising and ongoing development of belief propagation as a paradigm for multiple-target tracking."

I find this paper to be a very nice read. I appreciate the way this paper creates a framework in which a number of multiple-target tracking techniques can interpreted and generalized.

I take this opportunity to recognize another outstanding paper entitled, "A Novel Algorithm for Radar Classification Based on Doppler Characteristics Exploiting Orthogonal Pseudo-Zernike Polynomials" by Carmine Clemente, Luca Pallotta, Antonio De Maio, John J. Soraghan, and Alfonso Farina. This paper appeared in the February 2015 issue of TAES. This is a creative paper that shows how to classify radar returns based on a novel application of Doppler measurements. It is phenomenological. It has a good idea, high-fidelity simulation, and real-data experiments.

These two papers are the two examples of the tremendous impact that TAES is having on both basic research and applied science and engineering. I am also pleased to announce that the impact factor for TAES broke the "2.0" boundary in 2018 and is currently 2.797. This achievement is a direct result of the increasing quality of the papers published in TAES.

TAES is only as good as its published papers, and these two examples represent the excellent quality of papers written by the creative and capable researchers in our field and improved by the dedicated work of our all-volunteer editorial staff.

As we approach 2020, I ask you to consider making a nomination toward the 2016 Carlton Award. If you read a paper that you like or makes a difference, nominate it! Just send me an email (mdr@byu.edu) with a short justification and a list of distinguished colleagues willing to write letters of support.

M. RICE, *Editor-in-Chief*