

# From the Editor-in-Chief

JUNE 2022



*Michael Rice*

This issue's column is devoted to the M. Barry Carlton Award. The M. Barry Carlton Award acknowledges what is judged to be the best article in the IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS. To help identify and assess what TAES article is best, the Carlton Award considers articles published four years earlier in TAES. As such, this year's Carlton Award is the 2018 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 the winner for 2018 is Yulong Huang, Yonggang Zhang, Bo Xu, Zheming Wu, and Jonathon Chambers for their article "A new adaptive extended Kalman filter for cooperative localization." This article appeared in the February 2018 issue of TAES.

Autonomous underwater vehicles (AUVs) have become increasingly important in a number of applications, many of which are squarely in the scope of TAES. GPS-based localization of AUVs is a challenge because of the unfavorable propagation characteristics of water for GPS signals. Consequently, AUV localization is usually based

on gyroscope- and accelerometer-based inertial navigation systems, in which error accumulation is due to drifts in the inertial sensors. Cooperative localization seeks to overcome the drift problem but depends on *a priori* knowledge of the covariance matrices, which, in practical scenarios, are unknown. This article addresses the problem by predicting the error covariance and measurement noise covariance matrices adaptively. The predicted covariance matrices are incorporated into an extended Kalman filter.

The article was nominated by the AESS Publications team and endorsed by Prof. Mathieu Joerger, Senior Editor for Navigation. Dr. Joerger felt that one of the main strengths of the article was the strong experimental demonstration. The main contribution is the derivation of an adaptive extended Kalman Filter with an expectation-maximization step. The novelty is that the expectation-maximization step focuses on the state prediction covariance matrix instead of on the process noise covariance matrix.

I found this to be a well-written article. The prose is crisp, clear, and to the point. The mathematical notation is clean and easy to follow for those familiar with the topic. It is also well cited.

This article is an example of the tremendous impact that IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS is having on both basic research and applied science and engineering. TAES is only as good as its published articles, and these two examples represent the excellent quality of articles written by the creative and capable researchers in our field and improved by the dedicated work of our all-volunteer editorial staff.

The redesigned AESS website is now online. The new website contains a page dedicated to the Carlton Award (<https://iee-eass.org/awards/publication-awards/m-barry-carlton-award>). I invite you to visit the page that contains a brief history of the Carlton Award, instructions for nominating an article, and a list of past recipients. A special thank you is offered to Amanda Osborn (Conference Catalysts, LLC) for directing the redesign of the web site.

As we approach 2023, I ask you to consider making a nomination for the 2019 Carlton Award. If you read a article that you like or makes a difference, nominate it!

MICHAEL RICE, *Editor-in-Chief*