# FUSION Conference Awards

Fredrik Gustafsson and Jason Williams

## FUSION 2018 BEST PAPER AWARDS

### ISIF 2017 JEAN-PIERRE LE CADRE BEST PAPER AWARD

"Scalable Magnetic Field SLAM in 3D Using Gaussian Process Maps"
Manon Kok, Delft University of Technology, The Netherlands and Aalto University, Finland, and Arno Solin, Aalto University, Finland

*The winner of the Jean-Pierre Le Cadre Award for Best Paper considers the problem of three-dimensional simultaneous localization and mapping (SLAM) using magnetic field measurements. The area being mapped is divided into overlapping hexagonal regions; within each region, the magnetic field is mapped using Gaussian processes, with efficiency aided through a truncated Eigendecomposition of the covariance kernel. A Rao-Blackwellised particle filter maintains samples of the history of sensor position and pose, each accompanied by a Gaussian distribution representing the map. An impressive experiment is presented using odometry and magnetic field data recorded from a standard iPhone, demonstrating the value of the magnetic field measurements for aiding position estimation.*

### FIRST RUNNER-UP

"On Integrating Human Decisions with Physical Sensors for Binary Decision Making"
Thakshila Wimalajeewa and Pramod Varshney, Syracuse University, USA, and Muralidhar Rangaswamy, Air Force Research Labs, USA

### SECOND RUNNER UP

"Total Belief Theorem and Generalized Bayes' Theorem"
Jean Dezert, French Aerospace Lab, France, Albena Tchamova, Inst. of I&C Tech, Bulgaria, and Deqiang Han, Xi'an Jiaotong University, China

### ISIF 2017 TAMMY BLAIR BEST STUDENT PAPER AWARD

"Remote State Estimation with Data-Driven Communication and Guaranteed Stability"
Xiaolei Bian, X. Rong Li, and Vesselin P. Jilkov, University of New Orleans, USA

*The winner of the Tammy Blair Award for Best Student Paper considers the problem in which a remote sensor iteratively transmits information across a constrained communication channel. An information push mechanism is described, whereby, using its own local estimator, the sensor determines when it is worthwhile contributing its new information based on the magnitude of the innovation. An estimator is constructed for the receiver utilizing the cumulative innovation, alongside the knowledge that previous innovation magnitudes were too small to warrant communication, such that the lack of transmission itself conveys information. A stability property of the estimator is proven.*

### FIRST RUNNER-UP

"Information Decorrelation for an Interacting Multiple Model Filter"
Duygu Acar, ASELSAN Inc, Turkey and Umut Orguner, Middle East Technical University, Turkey

### SECOND RUNNER UP

"Multi-Sensor Multi-Object Tracking with Different Fields-of-View Using the LMB Filter"
Suqi Li, University of Electronic Science and Technology, China, Giorgio Battistelli, Luigi Chisci, Università delgi Studi di Firenze, Italy, and Wei Yi, Bailu Wang, and Lingjiang Kong, University of Electronic Science and Technology, China

The selection process for the awards was based on the following steps:

► Papers co-authored by FUSION 2018 Chairs are not eligible for awards and these were ruled out.

► A long list of 50+ papers was created based on the reviewers' scores and comments.

► Two short lists with 10 and 11 papers were selected based on a combination of good review scores (>4.2), award recommendations (59 in total!) and insightful review comments.

► Based on the short lists, an external award committee with eight members was selected.

► The award committee was split into two groups to minimize conflicts of interests.

► Each group ranked all papers in their respective short list.

► Thereafter, a free discussion followed on the final ranking list.

The competition was hard, and it was not easy to rank the papers in each category. However, in the end, the two winners were singled out as outstanding contributions. The award committee consisted of Sanjev Arulampalam, Erik Blasch, Felix Govaers, Gustaf Hendeby, Mahendra Mallick, Simo Särkkä, Elisa Shahbazian, and Ondrej Straka, and the award chairs are very thankful for their thorough work despite the short time span.