Yajun Zeng

Curriculum Vitae

Automatic Target Recognition (ATR) Lab, Room 203, Beihang University, Beijing, China
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˝ Third-year Ph.D student

Education

2018.9–present: **Ph.D**, *Electronic and Engineering (EE), Beihang University*, Beijing, China, GPA:3.76/4.

2014.9– 2018.7: **Bachelor**, *Geophysics, China University of Mining and Technology*, Beijing, China. GPA: 3.82/4, Rank: 2/30.

Research Interests

Information Fusion, Target Tracking, Track Management, Bayesian estimation, Parameter Estimation, Signal Processing

Publications

Journal

[1] J. Wang (Advisor), **Y. Zeng,** S. Wei, *et al*, "Multi-Sensor Track-to-Track Association and Spatial Registration Algorithm Under Incomplete Measurements," *IEEE Transactions on Signal Processing.*, vol. 69, pp. 3337-3350, May 2021.(Published) [Link]

Conference

[2] J. Wang (Advisor), **Y. Zeng**, S. Wei, *et al*, "Track-to-Track Association Algorithm Based on Adaptive Clustering Threshold," *IEEE International Conference on Signal, Information and Data Processing* (ICSIDP), 2019 pp. 1-4.(Published) [Link]

[3] **Y. Zeng**, J. Wang, S. Wei, *et al*, "Spatial Registration Based on Weighted Fusion of Multiple Significant Targets," *IEEE CIE International Conference on Radar*, 2021. (Accepted)

Patents

[4] J. Wang (Advisor), **Y. Zeng**, C. Liu, S. Wei, *et al*, Spatial Registration Algorithm Under Incomplete Measurements, 2021. (Under review)

† **Note.** In most universities of China, the first student author equals to the first author.

Experience

Research Experience (Completed)

2020.5–2020.9: **Spatial Registration Algorithm Under Incomplete Measurement**.

Main works[1] [3] [4]:

- Proposed a residual bias estimation registration (RBER) method based on maximum likelihood.
- The RBER method realized the update of incomplete measurements by sequential filtering technology and eliminated the systematic bias of sensors by using information on the significant targets.
- Compared with the MLR algorithm, the parameter estimation accuracy of the proposed algorithm was largely enhanced.

2019.9–2020.9: **Heterogeneous sensor fusion**

Main works:

- Proposed a sequential filtering method based on Extended Kalman.

- In the complete measurement, the sensor can measure the complete three-dimensional position information (range/R, elevation/θ, azimuth/φ) of the target, while in the incomplete measurement, such complete information cannot be obtained.
- The method realized the update of incomplete measurements by sequential filtering technology.

2018.9–2019.8: **Track-to-Track Association**

Main works[1] [2]:

- Proposed a the sequential m-best track association algorithm based on the new target density (SMBTANTD).
- The SMBTANTD algorithm introduces a new target density in the correlation matrix, which effectively solves the association problem in scenarios where the numbers of targets measured by multiple sensors are inconsistent. Moreover, the SMBTANTD algorithm can also improve the cost likelihood function to increase the track association rate.
- Compared with the association algorithm based on traditional fuzzy functions and generalized likelihood, the association performance in terms of association accuracy using the SMBTANTD method was globally improved.

Research Experience (On-going)

2020.9–Present: **Track File Management**

Main works:

- Propose a new track management method based on Multiple Hypothesis Tracking (MHT).
- Based on MHT, time series management of track-to-track association is carried out to obtain system track number.
- Evaluate the effectiveness of the method for track management.

Teaching Experience

2019.3–2019.6: **Teacher Assistant**

- " Training of Electronic Design" for undergraduate student.

2018.9–2019.1: **Teacher Assistant**

- " Digital Signal Processing" for undergraduate student.

Social Experience

2016.7–2017.7: **Excellent Volunteer**

- (Warm Winter Clothes)

2015.7–2016.7:

- Deputy Minister of Student Club in China University of Mining and Technology

Awards and Scholarships

Some selected honors:

2018.7: **Outstanding Graduate of Beijing City**

2018.7: 3nd Prize in Geophysics Competition for Chinese College Students. National Level

2017.9: Outstanding Student of China University of Mining and Technology

2017.9: Academic Scholarship of China University of Mining and Technology, First

2016.6: **National Scholarship**

- Directly awarded by the National Ministry of Education

2016.6: Academic Scholarship of China University of Mining and Technology, Second

Software skills

Programming：Python, Matlab, C, C++

Platform：OpenCV

Word-editing：LaTex, Microsoft Office, Adobe Acrobat