CURRICULUM VITAE

Guangyang Zeng

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EDUCATION

- **Ph.D. Candidate**, (Sep. 2017 – present)
  College of Control Science and Engineering, Zhejiang University, Hangzhou, P.R.China
  Advisor: Peng Cheng.
  Co-advisor: Junfeng Wu.
  Thesis Proposal: Research on Multi-sensor Data Fusion Algorithms in Target Sensing
- **B.Eng.**, (Sep. 2013 – Jun. 2017)
  College of Control Science and Engineering, Zhejiang University, Hangzhou, P.R.China
  Outstanding Graduate

RESEARCH INTERESTS

Multi-sensor data fusion, Decision fusion, Statistical analysis, Machine learning, Detection and localization, Anti-drone systems.

AWARDS AND HONORS

- Third Prize of the 16th "Challenge Cup" Extracurricular Academic and Technological Works Competition of College Students in Zhejiang Province, Zhejiang Province, China 2019
- Outstanding Graduate, Zhejiang University, China 2017
- Second Prize of Mathematical Modeling Competition of Zhejiang University, Zhejiang University, China 2016
- Third-class Scholarship for Outstanding Students, Zhejiang University, China 2014, 2015
- First Prize of Physics Innovation Competition for College Students in Zhejiang Province, Zhejiang Province, China 2014

PROJECTS

- Intrusion Detection and Counteraction of "Low-Slow-Small" Aircraft for iCPS Security, The Fundamental Research Funds for the Central Universities (2017XZZX009-01)
- Small UAV Intrusion Detection Based on Swarm Intelligence Perception, National Natural Science Foundation of China (No.61772467)

PAPERS

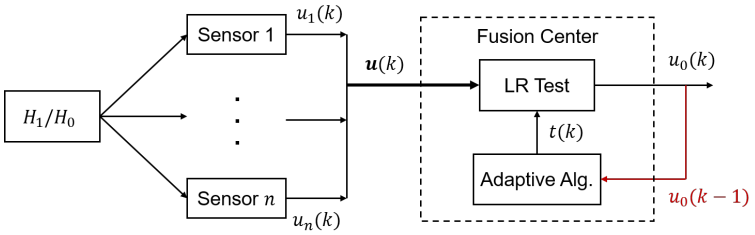
[1] **Guangyang Zeng**, Junfeng Wu, Xiufang Shi, and Zhiguo Shi, "A Novel Decision Fusion Scheme with Feedback in Neyman-Pearson Detection Systems", The 56th Annual Allerton Conference on Communication, Control, and Computing, Urbana-Champaign, USA, 2018.

[2] A TDOA-Based Localization Method by Solving Non-convex Quadratic Optimization, in Preparation.

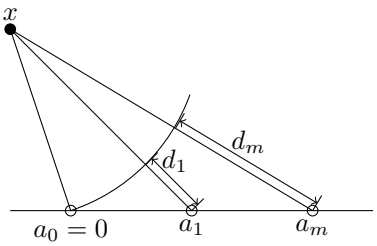
[3] A Performance Conserved Low-complexity Feedback-based Decision Fusion Algorithm under the Neyman-Pearson Criterion, in Preparation.

RESEARCH DESCRIPTION

- **Decision Fusion with Feedback**
  Consider decision fusion in multi-sensor detection systems, the fusion center (FC) gives a global decision based on local decisions made by each sensor. It's noteworthy that the use of historical information, such as the feedback of previous decisions can significantly improve the detection performance. Nevertheless, considering the dramatically increased computational complexity caused by feedback, only one bit memory is supposed in the FC to store the feedback of previous global decision. To further reduce computational complexity, we propose a low-complexity algorithm where the feedback is utilized to adaptively select the threshold of likelihood ratio (LR) test in the FC. The convergence of the proposed algorithm is proved and the performance comparable to the oracle optimal algorithm is derived.



- **TDOA-based Source Localization**
  Source localization is the basic in extensive location-based applications. We utilize the time-difference-of-arrival (TDOA) measurements to locate a source. Just like some previous works, we formulate the source localization as a non-convex constrained least squares (CLS) problem in the sense of minimizing the squared errors. As far as we know, no literature has derived the global solution to the CLS problem. In this work, we have developed a workflow for seeking a global minimizer of the CLS problem based on the Lagrangian multiplier method. Moreover, we perform a thorough computational error analysis and devise termination conditions to meet the pre-set precision requirement. The termination conditions are built on the Lagrangian multiplier and are easy to execute which ensures the real time of the algorithm.



- **Drone Detection Based on Heterogeneous Sensor Fusion**
  The abuse of amateur drones has resulted in emerging threats to personal privacy and public security. To alleviate these threats, we have designed an anti-drone system that integrates multiple sensors, including microphones, RF antennas and cameras. How to fuse these heterogeneous data to enhance detection performance is a challenging problem. We apply specific methods for each kind of sensors to produce some probabilities about the existence of a drone. Then we use the copula theory to depict the complex and nonlinear correlations among these probabilities. However, the correlations are generally nonstationary, we will further investigate the adaptive algorithm to select copula models based on the observed environment state.