Progress report

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We implement the global optimum numerical iteration algorithm for independent distributed sensor system.

Let the fusion rules of the fusion center be , each senor’s decision threshold be ,. And let the Bayesian Risk respond to be .

We fixed , and find the best fusion rules for the system, and let it be , therefor the Bayesian Risk respond to  would be no greater than . Likewise, we fix  and find the best decision threshold of the first sensor in terms of the whole system . And the Bayesian Risk respond to  would be less or at least the same. The rest can be done in the same manner, after we obtain the decision threshold , we fix and find the best decision threshold . After we renew all the sensor’s threshold we can get Bayesian Risk respond to  , where 



Depend on what we have derived above, we can get the global optimal detector by the using of recursion. Details are following:

1 Randomly choose a fusion rule  and one sensor detector ,, then calculate the Bayes’ risk which depends on . And set the recursion variance n=1, recursion end variance .

2 Given  are fixed, calculate the fusion rule  depend on the equation

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3 For the k-th sensor in the system, where , fixed  , then calculate sensor detector  depend on equation .

4 Calculate the fusion system Bayes’ Risk  which depend on . If , let n=n+1 and do the recursion, otherwise the recursion ended and let  be the global optimal detector.