1.6.2 Model Based Approach

In this section, the trajectory of moving target is achieved using model based approach, which is utilized as baseline for other approaches. In the real application case, it is not feasible that the fusion center can get all the information about the moving target. Here, it is supposed that there is mismatch between the hypothetical model and real model in terms of measurement noise covariance . Denote   as the nominal measurement noise covariance. Thus, under hypothesis, measurement is assumed to be , by solving the optimization problem below,

the state of moving target at time can be derived. The trajectory performance for Sim 1 data using model based approach can be seen in Figure 75. In the Sim 1 simulation, it is supposed that the nominal measurement noise covariance is diag([4,5,6,4,5]), which corresponds to the measurement data-one image sensor , and three SigInt sensor data.



Figure : Trajectory Performance for Sim 1

Figure 76 shows the corresponding estimation error along the x and y coordination. From Figure 76, we can see that under the case that if there exist mismatch between the nominal measurement noise covariance and real covariance, the system is not able to estimate the position of moving target with comparatively smaller error. The proposed approaches in this project are non-model based approaches, the position of moving targets can be estimated with smaller estimation error comparing to the model based approach.



Figure : Trajectory Estimation Error

Overall, the paper is of good format, through reference is provided. Basically, authors describe the design and implementation of a multi-factor authentication system protecting the system from being attacked by various types of the attacks. However, I got some questions and suggestion at the same time.

1. Please pay an attention to the figure consistency, such as in Section III, ‘during signup users draw a line pattern…, shown by Figure 1’, which I think should be Figure 2.
2. In Section IV, the implementation detail and performance of proposed authentication system are shown. Is that possible that the authors can provide some numerical results in term of user convenience. Because right now the famous authentication is the two-factor authentication system where the users can authenticate themselves by typing the confirmation they receive from the device nearby. What is the performance between the proposed approach and the well-existing techniques. Please identify it.
3. For the randomization, how do you guarantee that the adversaries can’t recognize the system ‘s time and data in order to hack the system. Also, I got some suggestion, in the paper, two of authentication stages are used for users to log in. I am not sure about the reason for using two, how about the number of the stages is also random, the authors can study the trade-off between the number of stages used and the system’s robustness.

Overall, the paper is of good format. Thorough reference is provided. Basically, a framework called VEDILS is presented, which could help the teacher to design and deploy the learning activity. Two teaching cases related to engineering and language are also provide to show the efficiency of proposed methods. However, at the same time I got some questions and suggestions as well.

1. In Section 3, it is shown that how the framework support teachers to design and deploying mobile activities. My suggestion is the framework is not restricted to the teaching area. Please identify it. That might further strengthen the paper. Also, in the paper, please denote the authors’ contribution as well.
2. In Section 4.2 a set of new blocks can be created for the integration of AR features, does the system have the capability of being able to be applied to other functionality with changing the overall structure. I think this is a necessity because as a teacher, he/she has many courses to teach at different time slots.
3. Section 6 provides two case study to show the validity of the proposed approaches. My concern is that the case size is comparatively small, which is hard to convince me. Cases of larger size will be better in terms of evaluating the performance of the proposed structure.

Overall, the paper is of good format. Basically, a robust multichannel impulse responses estimation is proposed based on Kalman filter approach. It is theoretically shown that the multichannel impulse corresponds to the eigenvector associated with the largest eigenvalue of the system estimation error matrix. Numerical results are also shown to validate the proposed approach.