Dear reviewer:

I am very grateful to your comments for the manuscript. According with your advice, we amended the relevant part in manuscript. Some of your questions were answered below.

Point 1: English language and style are fine/minor spell check required

Response 1: We have used a professional English editing service from MDPI to check grammar, spelling, punctuation and some improvement of style.

Point 2: How to get (20) from (1)-(19)? It cannot be too simple.

Response 2: Thank you for your question. As shown in our manuscript, we can get Equation (12)– (19) through the Euler–Lagrange equation, and Equation (20) is a matrix representation of Equation (12)– (19). We further illustrated the parameters of Equation (20) in a new version of our manuscript.

Point 3: Why is the equation (20) linear rather than nonlinear?

Response 3: Equation (20) is a 2–order differential equation, which cannot be directly calculated to get exact solution. Thus, we first apply the knowledge of linear algebra to transform the Equation (20) into a 1–order differential equation. Then, we use the 4-order Runge-Kutta algorithm to converted the 1–order differential equation into a linear equation for combining with the Kalman filter algorithm. We provided more details in a new version of our manuscript.

Point 4: It may be wrong to claim that "The equation (24) was converted into the 4-order Runge-Kutta equation". We can say "use the 4-order Runge-Kutta algorithm to solve the equation (24). "when turn right", "when turn left", here "turn" should be "turning". By the way, some "Where" should be "where".

Response 4: Errors about article formats, formulas and figures have been corrected in a new version of our manuscript.

Thank you for the kind advice.

Sincerely yours,
Wenhang Li