Dear Reviewer:

Thank you very much for your supervision of the reviewing process of our Manuscript ID: sensors-605073 entitled “Energy-Efficient UAV-Enabled MEC System: Bits Allocation Optimization and Trajectory Design”. We also highly appreciate the Reviewer’s carefulness, conscientious, and the broad knowledge on the relevant research fields, since you have given us a number of beneficial and constructive comments and suggestions. Based on these valuable feedback, we have made careful modifications in our revised manuscript.

Furthermore, all the comments have been given consideration in preparing the revised version of the manuscript. A point-by-point response to the comments is provided below. In our responses below, we firstly reproduce the reviewers’ comments and suggestions in italic fonts, and then provide our replies with standard black fonts. Finally, we give the revised details towards each review both in our manuscript (blue/red marks) and this response (blue marks).

**Reviewer 1:**

The paper presents an algorithm for offloading mobile computing into passing UAV. The presentation is clear and the analysis is sound.

1. I would like the authors to discuss more about energy consumption during communication. It is well known that distance greatly affect wireless communication, but the presented approach seems rather simplistic in this regard. However, being such a complex problem, I do not believed that this is a major issues, just a future improvement.

**Answer:**

Thanks for your precious review and comments. We totally agree that the communication energy consumption is important and the distance greatly affects the wireless communication. In our paper, the distance was considered in the
communication energy consumption. The energy consumption of communication for ground users is:

\[ E_G = E_G^U = \sum_{n=1}^{N} \sum_{k=1}^{K} \frac{2^{\frac{R^{[n]}_{su}}{B^s}} - 1}{g_k[n]} \sigma^2 \delta, \]  

(1)

where \( g_k[n] \) is the channel gain from the ground user \( k \) to the UAV in the \( n \)th slot as given:

\[ g_k[n] = \frac{g_0}{h^2 + \|q_u[n] - q_k\|^2}. \]  

(2)

The channel gain is related to the distance from the UAV to the ground users. The energy consumption of downloading the output results from the UAV to the ground users is given as

\[ E_{U}^D = \sum_{n=1}^{N} \sum_{k=1}^{K} \frac{2^{R^{[n]}_{bs}} - 1}{g_k[n]} \sigma^2 \delta. \]  

(3)

Consequently, the distance between the UAV and the ground users in the communication energy was considered in our paper which are shown in the conclusion.

What’s more, a more complicated energy consumption model of communication will be considered in our future work.

2. My main concerns is whether this kind of computational offloading is applicable, as I can think only in some scenario. However, I think that the works has its merits, and that nowadays it could be used in some scenarios, such as military ones.

Answer:

Thanks for your comments and suggestions. We are very sorry that we make you confused about the application of this kind of computation offloading. In the areas where the communication facilities are sparsely distributed, especially in remote areas, the fixed MEC server can not satisfy the computation requirements of the remotes users. Besides, when communication infrastructures are damaged, malfunctional or overloaded, the computing tasks of the users can not be processed in time. Fortunately, UAVs have the characteristics of high mobility and easy deployment, making the on-demand communication services provision possible. For example, after disasters, the ground infrastructures are
damaged and can not provide computation services. The UAV-enabled MEC systems can provide offloading services for ground users timely. The UAV is capable of flying to the specific areas to help the users with computational requirements, e.g., monitoring devices, to compute the tasks. Thus, the UAV-enabled MEC systems are of great importance in many scenarios. To make the application scenarios clear, we added the explanation in the Introduction. The corresponding modifications are listed as below.

**Revision:**
MEC enables the mobile base station (BS) to equip with the powerful computing capability, which significantly relieves the pressure of the mobile networks. However, in the areas where the communication facilities are sparsely distributed, especially in IoT, the fixed MEC server can not satisfy the computation requirements of the remotes users. Besides, when communication infrastructures are damaged, malfunctional or overloaded, the computing tasks of the users can not be processed in time. Hence, it is necessary to devise a scheme that the MEC servers can satisfy the computation demand timely. Fortunately, UAVs have the characteristics of high mobility and easy deployment, making the on-demand communication services provision possible [5][6]. Recently, UAVs have attracted a lot of attentions in many applications, such as delivery, farming, rescue response and communication services [7]. UAVs are expected to play the role of wireless communication platforms equipped with communication modules [8]. UAV-enabled MEC system can provide on-demand computation services for the mobile users with on-demand mobility compared with the fixed communication infrastructures. In the areas where the fixed communication infrastructures can not satify the computing requirements of ground users, such as the places which are remote from the communication facilities and the places destroyed by the natural disasters, the advantages of UAV-enable MEC system are highlighted. The UAV is capable of flying to the specific areas to help the users with computational requirements, e.g., monitoring devices, to compute the tasks. Owing to the on-demand mobility, the UAV-enabled MEC system can greatly relieve the load of computation in the specific areas.

At last, special thanks to you for your good comments and interests in our paper.

We have tried our best to improve the manuscript and made some changes in the manuscript. These changes will not influence the content and framework of the paper. They are around your comments in general.
We appreciate for Editors/Reviewers’ warm work earnestly, and hope that the correction will meet with approval.

Once again, thank you very much for your comments and suggestions. The valuable suggestions and comments are instructive and meaningful to our future research!