We would like to thank the reviewers for their comments and feedback to improve the quality of the paper.

Reviewer: 1

Comments to the Author

This manuscript proposes a command strategy to improve human operator performance especially to minimize difficulties of novice human operator in teleoperation tasks. The virtual fixtures are introduced as a means to minimize collisions and assist in navigation. The command strategy is used to coordinate control between the arm and the base of the system, prevent collisions with known obstacles, and alert the human operator of proximity to those obstacles with haptic forces. Through the experimental on the six dof Omnibot mobile-manipulator system, the effectiveness of the virtual fixture method is demonstrated. I think the proposed method for teleoperation of this manuscript is interesting and usable.

It should be made major revision, there are some problems or deficiencies as follows,

1. The structure of the manuscript is less logical, the section 2 test platform should be put behind section 3. Usually, a method or principle is firstly introduced, then the analysis is given, after that the experiment system is described and experiment is implemented.

Sections have been reordered as requested.

1. Fig.2 should be cancelled, because the Omnibot mobile-manipulator system has been shown in Fig.1.

Fig 2 has been removed.

1. Fig.3 is written bad and so big, it should be written compacted.

Fig 4 has been removed.

1. Fig.7 should be put at the side of Fig.8, so that the fig.7 cab be cancelled.

Fig 7 and 8 have been merged.

5. In section 1, some important references related to the mobile-manipulator systesm as following should be cited,

[1] Guo Yan, et al. "A combination of terrain prediction and correction for search and rescue robot autonomous navigation." International Journal of Advanced Robotic Systems, 2009, 6(3): 207-214.

As mentioned in this paper, humans are quite good at terrain prediction and optimal path generation. Since our work includes a human in the loop, there is no need for this type of autonomous path planning as it is done by the operator.

[2] Li Xin, et al. "Real-time obstacle avoidance for telerobotic systems based on equipotential surface." International Journal of Advanced Robotic Systems, 2012, 9(71).

Cited in literature review.

[3] Xiong P, et al. “Operation modes and control schemes for a telerobot with time delay” International Journal of Advanced Robotic Systems, 2012, 9(57).

Cited in literature review.

6. In section 1, some important references related to the virtual environment for teleoperation aid as following should be cited,

[1] Lu Xiaomin, et al. "Spatial Motion Constraints Using Flexible Virtual Fixtures." Applied Mechanics and Materials. Vol. 427. 2013.

Unable to obtain document.

[2] Huijun Li, et al. "Virtual-environment modeling and correction for force-reflecting teleoperation with time delay." IEEE Transactions on Industrial Electronics, 54.2 (2007): 1227-1233.

Cited in literature review.

7. In section 3, the stability of the location-based control should be analyzed, especially in the case of manipulation mode changes.

This research focuses on the high level kinematic control where stability from mode changes is not an issue. The operator is physically unable to send commands to the MMS fast enough to cause stability issues.

8. In section 4, the force vector in manipulation space when robot near the virtual wall and contact the virtual wall should be shown in graph.

As discussed in Equation 5, the force is proportional to the virtual fixture penetration.

9. The author should improve technical writing level of the manuscript.

A thorough editing of the paper has been done.

Reviewer: 2

Comments to the Author

The paper is technically correct, but it is unclear the avance that provides in the state of the art.

The authors should clarify important points of the paper for publication.

* They are not considered models of master and slave. Closed systems are considered. The proposal is valid forever or only for devices used?. Generally, the master model is strongly nonlinear.
* The proposed command strategy is valid for mobile manipulator systems with holonomic bases, this has been clarified in the paper

- The problem is solved without considering delays. This is an important simplification.

Based on the other reviewers recommendations, time delay has been discussed. However, the time delay present in this research was negligible (0.02 seconds) and did not affect performance. Further research will include effects of time delay

* - It is not clear how many degrees of freedom are controlled (manipulator and mobile robots?) Simultaneously (only 3?). It should be clarified whether any technical switching control between slave and slave manipulator mobile robot applies.
* As stated in Section 2.2, only 3 DOF are controlled at a time. Sections 2.4.1, 2.4.2, and 2.4.3 discuss in detail which DOF are controlled in their respective control modes. The switching of control between master and slave manipulator is determined by the control modes, discussed in Section 2.4.
* Clarify whether there is not mentioned coordinate transformation at work or is not clear to this reviewer.
* As mentioned in Sections 2.1 and 2.4, the operator need not perform coordinate frame transformations as the system is controlled in the same world coordinates the operator is in. More detail has been added to section 2.4.2 and 2.4.3 to clarify this point.
* The authors do not model the human operator. What information that the human operator is fed ?,  video and force?.
* The operator receives haptic feedback and visual information. Section 4.1 and Figure 8 have been updated to clarify this.
* As the force exerted by the human operator is used ? It is useful to have this information?
* This information may be useful in other research, but only the position of the master end effector is used for control. Amount of force is information the operator uses to determine the course of action. The operator does not apply forces, the joystick applies forces to the operator.
* Only, the force is fed back due to the virtual characteristics or for example due to collisions actual mobile robot against possible obstacles.
* Section 2.3.2 has been updated to clarify how virtual fixtures can be implemented such that they allow interaction without collision.
* Clarify whether it is possible to modify or add virtual characteristics during task execution.
* Section 2.3 has been updated to clarify this point.
* Clarify whether it intended to assess the transparency of the proposed teleoperation.
* There is no measurement of transparency other than time delay measurements (found to be negligible) and amateur operator testimony (of which they were not aware of the definition of transparency).

- The tables shown are correct. The graphs presented no help evaluate the proposal and should be improved by incorporating additional information such errors, speed (control actions), etc.

The learning curve graph is used to demonstrate how quickly the operator can learn a command strategy, and which one is faster to learn. The consistency of the single joystick command strategy learning curve versus the dual joystick command strategy learning curve, which varies greatly from operator to operator, shows that the dual joystick command strategy has an unpredictable learning time where the single joystick command strategy has a more predictable learning curve. The example test runs show how the virtual fixtures effectively prevent collisions with obstacles.