Dear Prof. Antonio Alisson P. Guimarães,

Thank you for your time. We believe that our manuscript has now improved by addressing to the comments from the reviewers. We have amended the manuscript accordingly, and please see the following response.

Replies to Reviewer 1

Comment 1:

Review on these existing works is not enough.

Response 1:This is our problem, and we have made corrections. Thanks a lot.

Comment 2:

What is relationship among in Subsections 3.2, 3.3 and 3.4?.

Response 2: There is a progressive relationship between subsection 3.2, 3.3 and 3.4. The core of our user selection scheme was describe in subsection 3.4, designed based on the idea of dynamic time warping. Subsection 3.2 and 3.3 provide the basis for downlink transmit time calculation. ESNR in subsection 3.2 is using for instead CSI feedback, and provide real-time information. Subsection 3.3 present a data rate estimation method based on ESNR.

Comment 3:

In the proposed scheme, the SINR, given in (7), or MCS-Rate should be feedback to the AP. In the meantime, the AP still need SCI to construct the beamforming vectors. Thus, compared to conventional scheme, overhead of the proposed scheme should be increased. How to evaluate this performance loss?

Response 3: Very good questions. Here we evaluate this performance by mathematical analysis. In 22 MU-MIMO system, the angle size is 12 or 16 bits, and 80MHz bandwidth has 234 usable subcarriers. The size of CSI feedback matrix is about 450 bytes, but the size of ESNR feedback at most 30 bytes. Suppose there are 20 users, and the modulation rate is 6Mbps. The conventional scheme time cost is , but our scheme is , even though the time cost of NDPA and NDP (both 7.4us) is need. Thank you for your comment, we have made some explanations.

Comment 4:

Writing of the paper could not be satisfied as a journal paper.

Response 4:

This is our mistake, and we have made corrections.

Replies to Reviewer 2

Comment 1:

All matrixes should be notated using bolded capital letters.

Response 1: This is our mistake, and we have made corrections.

Comment 2:

In Page2, line 32 can be changed as, Channel State Information (CSI) or Signal-Noise Ratio (SNR), ….

Response 2: This is our mistake, and we have made corrections.

Comment 3:

In Page2, line 35 “Most solutions select the optimal beamforming group based on understanding the full CSI of all potential users:

Response 3: This is our mistake, and we have made corrections.

Comment 4:

In Page 3, Line 38, the abbreviation can come after the elaborated word.

Response 4: This is our mistake, and we have made corrections.

Comment 5:

In Page 3, line 53, 54 typo error.

Response 5: This is our mistake, and we have made corrections.

Comment 6:

The ZF beamforming consume huge transmission power. Justify…

Response 6: Sorry, I don’t remember this sentence in this paper, because our work do not consider power control. Please correct.

Comment 7:

The reference of ZFBF-EP is not given & the ZFBF-EP significance is also not explained. (page 4, line 10)

Response 7: This is our mistake, and we have made corrections.

Comment 8:

Page 4, line 35 .. What is channel time cost of existing scheme?

Response 8: It’s the total time overhead of CSI feedback, and we have made corrections in the paper.

Comment 9:

What does ‘K’ implies?

Response 9: K denote the size of concurrent beamforming group. It’s introduced in subsection 3.1.

Comment 10:

What is a NDP frame?

Response 10: It’s Null Data Packet frame, we have added the full names in the paper.

Comment 11:

Typo errors in equation (6)

Response 11: This is our mistake, and we have made corrections.

Comment 12:

How the author has arrived to equation (7) and what is the factor M represents?

Response 12: This is our carelessness, and we have made changes with enough explanations. Factor M is the number of transmitting antennas of AP, which is introduced in subsection 3.1.

Comment 13:

Typo error at Page 7 line 26.

Response 13: This is our mistake, and we have made corrections.

Comment 14:

What is T\_0 in equation (8).

Response 14: is the network overhead (such as channel sounding or feedback overhead). This is our mistake, and we have made corrections. Thanks a lot.

Comment 15:

What is a channel access time X\_u. How it is considered in simulation?

Response 15: This paper is a simulation-based work and hard to consider the channel access time. It’s hard to evaluate the channel sounding time or feedback overhead. So our work does not consider channel access time. Please understand.

Comment 16:

In Fig 3, Jains fairness index shows trough and crest across the increase in number of users.. Justify.

Response 16: Very good questions. While the size of candidate user group is small, the sample distribution is uneven, which lead some trough or crest in the performance curve. We have made explanation in the paper.

Comment 17:

In Fig 4, when number of antenna is 3,6,7, the proposed TOUSE shows lower throughput in comparison with other algorithm. But this situation not persists in other cases of antenna counts. Justify.

Response 17: Very good comment. First this is our mistake, because MU-MIMO transmissions are limited to four client in 802.11ac standard. We have restart this experiment, and due to the fairness consideration, TOUSE shows lower throughput in comparison with other selection scheme. We made full explanation in the paper. Thanks a lot.

Comment 18:

The related work can come along with Introduction section.

Response 18: This is our mistake, and we have made corrections.

Comment 19:

References are not cited in ascending order.

Response 19: This is our mistake, and we have made corrections.

Comment 20:

Typo and grammar errors should be corrected throughout the manuscript.

Response 20: This is our mistake, and we have made corrections.

Replies to Reviewer 3

Comment 1:

It is definitely much better if the 802.11ac system perspective can be merged into the main theme in the writing, at least in the introduction.

Response 1: Thank you for your comment and we have modified.

Comment 2:

Usually, the related work section is right after the introduction, and I find the authors put this in section 5. By go through the papers cited, I believe there is still a need to emphasize what the very latest and key efforts are for MU-MIMO user selection.

Response 2: Thank you for your comment and we have made corrections.

Comment 3:

I would suggest a brief discussion section about how the proposed work may be applied in the WiFi or further commercial systems.

Response 3: Thank you for your comment and we have made some changes. In this paper, we hope our research will be a significant step in future study for commercial systems.

Comment 4:

Please double check the typos in the writing and equations. For example, the square in eq. (6).

Response 4: This is our mistake, and we have made corrections.

Comment 5:

In section 4, please specify the parameters and channel statistics used for the simulation, and explain explicitly why those parameters are selected in that way.

Response 5: Very good comment and we have made more explanation for the simulation environment.

Replies to Reviewer 4

Comment 1:

There are quite a number of grammatical and sentence structure errors.

Response 1: This is our mistake, and we have made corrections.

Comment 2:

The contribution of this work should be strongly emphasized, and justified.

Response 2: Thank you for your comment and we have made some changes.

Replies to Reviewer 5

Comment 1:

Specifically, the proposed algorithm should be explained in more detailed. For example, it is said that the candidate users are selected by correlating their transmission times with the currently selected users, following the idea of dynamic time warping. However, it is not clear how this is actually carried out, so more details would be desirable. Similarly, more details should be provided regarding the constraints (9) and (10), how they are exactly obtained (are there some heuristics there?) and more explanations about their meaning. To sum up, this part is the core of the paper so it should be as detailed as possible.

Response 1: Thank you for your comment and we have made some changes. The time constraint based on the principle that do not increase the transmission time waste. While *user2* belonging to the beamforming group, if only transmit user2 alone, time waste is 100s, due to transmission resource waste. But if put user1 into beamforming group, it only waste 99s, which is not bad for system. While user1 belonging to the beamforming group, it’s a bad choice to put user2 into beamforming group. Because time waste is 1s if transmit user1 alone, otherwise it will make user1 waste 99s and maybe there will be a best partner for user2 in next transmission time slot.

Comment 2:

Throughout the paper the word capacity is used to referred to the achievable rate. However, the capacity is a fundamental limit relative to the channel and independent of the specific strategy. Therefore, the word capacity should be replaced by, e.g., achievable rate, throughput or any other similar word.

Response 2: This is our mistake, and we have made corrections. Thanks a lot.

Comment 3:

In Section 3.2., you talk about the effective SNR, which depends on the BER. Is this BER coded or uncoded? In the latter, is it practical? Could it be modified to include the coded BER?

Response 3: This is our carelessness. It’s coded BER, and we have made corrections.

Comment 4:

In the simulations the bar plots cannot be interpreted in black and white. Using different filling patterns would help.

Response 4: This is our mistake, and we have modified. Thanks a lot.

Comment 5:

In the simulations, some details about the system setting are missing. Are you considering the 802.11 standard? This is actually a bit confusing in the paper, since at first a general MU-MIMO scenario is introduced in general, but at some point it seems to be particularized to a WLAN. It should be clear from the beginning if the considered scenario is a WLAN or something more general.

Response 5: This is our carelessness. This paper is focus on WLAN, and we have made corrections.

Comment 6:

I find it a bit weird that the related work is explained at the end of the paper. It would be more consistent with the flow of the paper if Section 5 is merged with the introduction.

Response 6: This is our mistake, and we have made corrections.

Comment 7:

There are many typos in the paper, so I will not enumerate here all. I suggest reading carefully the paper to correct them. The English could also be improved.

Response 7: We have corrected the grammar mistakes carefully. Thanks a lot.

Comment 8:

Some terms are used without being defined, such as AP or MCS.

Response 8: This is our carelessness. We have added the full names for AP and MCS.

Thank you again for handling our manuscript. Please do let us know if further concerns are raised, so that we can make improvement correspondingly.

Regards,

Zhaoshu Tang