This paper shows a solution for muscle fatigue assessment

in the upper limb. Based on your results, the synergies

domain analysis appears to be reliable and feasible. There

are only two small details in the paper that confused me.

First, the second paragraph in section 4 refers to Figure

4: 1. For 'average TFM was consistently over 25% less than

starting TFM for the FDP and FPL', is the average TFM the

horizontal line? Also, how do you compare the starting TFM

and average TFM based on the figure to get the value of

25%?

2. For 'No significant change for the EDC muscle', I am not

sure what is the change you mentioned here? For example, if

the change of TFM deviation(region area) is the change you

mentioned, it seems FDP got less difference between trail 1

and trail 3. If the change means the shape of the pattern

across the three trails, then EDC has less change.

Second, I think it may be better to point out what the x

and y axes are in Figure 6.

You did great work and I am looking forward to seeing

the synergy-based online sEMG-based control in your future

work. Thank you!

I. SUMMARY

This paper assesses neuromuscular fatigue during hand poses via quantitative analysis of neural excitation vectors using sEMG data collected from various muscles; it includes experiments from five participants. The authors compared time-frequency- and synergy domain metrics to find that synergy domain sEMG analysis reveals quantifiable neuromuscular adaptation to muscle fatigue in hand poses.

II. COMMENTS

* Please insert a comma or “and” between author names.
* Please avoid ending sentences with prepositions, e.g., “to.”
* Extra hyphen on “time-frequency” in abstract.
* Sentences are often quite long. The reviewer believes readability would be improved by shortening sentences. E.g., “sEMG sensing ordinarily suffers from poor signal-to-noise ratio requiring that multiple sEMG sensing nodes over individual and groups of muscles be assessed simultaneously with extensive filtering and processing to generate usable metrics.”
* Page 2, paragraph begins without capital letter.
* It appears that the margins on the right side of the page are off, i.e., the text is outside of the useable area.
* How was the MVC calculated? Was it averaged over the 60 second window?
* Extra parenthesis, “picking up an object (two finger and three finger pinch))”
* Equation (1), please define the variables, e.g., ω, τ, x, and so forth
* Are the V, W, H of (2) different from the V, W, H of (3)? If so, is there an opportunity to use different notations? It appears each of these variables are defined twice, and differently. These sentences should be restructured to improve readability.
* Please define terms in (4)
* Figures 3 and 4 - unless mistaken, there was a 60 second break in between each trial.. so why is the time axis continuous, when this appears not to be the case?
* Figure 4, capitalize “time”
* Figure 6, x-axis?
* Please define participant (P.X) outside of Figure 5 caption, since it is used elsewhere (e.g., Figure 6).
* Figure 7, please use consistent line widths (bottom subplot). Caption would also benefit from linking colors with their respective grasp.
* The sentence, “Synergy-based analysis of sEMG data provided robust muscle activation characteristics in the lower dimensional space of neural excitation (ie. 3x60 sEMG sample vector in 60-sample computation epochs → 3x3 neural excitation vector representing excitation of three synergies to three muscles x 3x60 excitation primitive vectors, representing three synergy primitives).” is difficult to read. Please check for proper notation and what is meant with the arrow?
* A matter of preference, but since “trial X” is used a label, the reviewer believes it should be capitalized, “Trial X.” Correspondingly, all figures would need to be updated, so it is left to the authors to decide.
* Please be consistent in use of “ie” vs “i.e.” vs “e.g.” - they should both be written as “e.g.,” and “i.e.,”
* Conclusion, could the authors please expand on how (specifically) these results could be used in terms of fatigue-aware exos? For example, does the robot assist more as the human fatigues? Does it provide feedback to the user? A high-level commentary is sufficient, but would help the readers understand context, since the paper is motivated by hand exos. III. SUMMARY The paper itself is interesting and contributes to the field. The paper, however, would benefit from the edits highlighted above (e.g., improved in terms of readability, context, and consistency). With these modifications, the reviewer believes it to be an appropriate conference paper.