JIDM reviews

We would like to thank all reviewers for the valuable comments and suggestions. Your reviews are crucial for the improvement of this research.

Answer: An answer to a reviewer's question;

Action: An action took based on the reviewer's comment.

Reviewer A

Reviewer's comments	Answers and Actions
C1: What kind of mobility patterns are extracted by task 4 of the process illustrated in Fig 1? A variety of mobility patterns have been proposed in the literature. What kind do you consider? Why?	Answer: In task 4, the model extracts two mobility indicators, the Radius of Gyration and the Displacement distance of the users. Similarly to other existing works, in this research, these two metrics represent the mobility patterns, and they were used due to the large adoption in the literature, as stated in the text. Action: The description of the two indicators was revised, making clear that they represent the mobility patterns considered in this research.
C2: How are these patterns extracted from the data provided by you data filtering task?	Answer: The two mobility indicators are extracted by analyzing the location of users' tweets to calculate, for each user, the values of Radius of gyration and Displacement distance. Action: This explanation is now added to the text, for both Radius of gyration and User displacement distance (Sections 3.1 and 3.2).
C3: How are the extracted patterns used in the task "5. Generating the correlation matrix"?	Answer: As stated in the text, these patterns are extracted, for each user, in task 4, and then task 5 calculates the correlations between these patterns and the social indicators of the Home regions and the Activity Centers regions. After all correlations are calculated, this task

	organizes these correlations in a matrix, in order to generate the output file containing the matrix. Action: In order to improve the understanding of the correlation matrix, we explained it better, showing that this matrix is just a user-friendly output.
C4: How is this matrix? Is it some of the tables presented in Section 5? Or were those tables derived from this matrix? If so, how they were derived?	Answer: Yes. The tables presented in the end of the article are fragments of the correlation matrix. Action: We make clear in the text that the tables presented as results are fragments of the correlation matrix.
C5: Unfortunately, I did not find a proper formal descriptions and examples of these structures and tasks in your paper. Therefore, it is hard to understand and assess the technical and scientific contributions of this paper, at least from its current contents.	Answer: If the reviewer is referring to the correlation matrix, this structure was explained in previous comments. Regarding the other tasks, we believe that they are clearly described in the text. But even so, we improved the formalization of step 5 of the model, showing how the correlations are calculated.
C6: The acronym LBSN is not defined in the paper.	Answer: True, but this acronym was replaced in this new version of the article by the term "social networks".
C7: Radius of Gyration (the value generated by equation 1) can be negative? In what situation? What is the criteria for deciding on this? Why? How ?	Answer: As stated in the text, this metric is a standard deviation of distances between all points of a user and the center of mass of these points. Thus, since it is a standard deviation, it cannot be negative. This metric was used in this research due to large adoption in related work with similar objectives.
C8: If the “radius_of_gyration” of Fig 6 is the of Tables IV and V, why are them so different in numeric terms?	Answer: In Fig 6 (that now is Fig 7), we show the numeric values of Radius of gyration. In the result tables, we show the statistical correlations between the Radius of gyration and the social indicators. The correlations vary from -1 to 1, where as close to 1 or -1, the higher

	the correlation is. Action: This explanation is now added to the text.
C9: The “log10” scale mentioned in Fig 6 is not clear.	Answer: This scale was adopted to make the visualization clear. Action: This explanation is now added to the text.
C10: Detailed and precise descriptions of how you calculate all the measures presented in Tables IV and V seem to be missing. Maybe some other formulas would help.	Action: We added a formalization of how the correlation coefficient is calculated. The formalization of the other value (p-value) would be quite long to fit in the document, but now, we describe it better in the article.

Reviewer B

Reviewer's comments	Answers and Actions
authors claim they propose an approach to extract mobility patterns from Twitter messages. If the contribution is the approach, authors should evaluate the suitability of chosen techniques (e.g., home/activity center detection method). The work is clearly stated in the literature regarding the analyzed variables however the contribution is not restricted to the particular correlation analysis presented.	Answer: The article proposes method of finding correlations between mobility patterns and social indicators. And for doing so, we need to extract mobility patterns. We also implement methods described in the literature (e.g., home detection and activity center detection) but we did not implement any validation to any of them. Action: In this revised version, we evaluate the suitability of the home detection method by using volunteers to analyze satellite images, in order to determine whether the detected residences seem to be real residences. For the activity centers, as they are just regions that a user frequently visits, we did not perform any validation of it.
Previous authors' work must be cited and the new contributions should be clearly stated. New content include the related work table, the algorithms and the heat maps showing the density of posts according to the location. In my opinion, authors should improve the contribution to justify a new publication.	Action: In this current version, we mention the previous article and state all new contributions: (1) a more detailed discussion of related work, including different researches and a table contrasting their main characteristics; (2) more detailed explanations of the methods of home and activity center detection, with the description of the algorithms used; (3) improvements in the results visualization by adding heat maps, showing the density of posts along the city of London; (4) validation of the home detection method, with the collaboration of volunteers; (5) an improved explanation of the mobility patterns properties; (6) a deeper analysis of the data, showing them by temporal ranges, improving the number of correlations found.
- The first paragraph of the introduction have sentences with unusual construction	Answer: Thanks for the suggestion. However, in both cases, the fragment follows "approach to...", where "to" is simply an ordinary preposition (not part of

- to extracting ==> extract - to detecting ==> detecting	an infinitive). If a preposition is followed by a verb, the verb should take the -ing form). It is correct for the same reasons that the following sentences are also correct: • I'm looking forward TO meeting you. • She's not used TO getting up early. • Mother Theresa devoted her life TO helping the poor. Other typos and errors were found and corrected in this revision.
Text corrections	Action: Text corrections applied.

Reviewer C

Reviewer's comments	Answers and Actions
Try to improve on your conclusions and, especially future work, in order to give readers a broader view of the possibilities opened up by your research.	Action: In this revised version, we had improved the conclusions to address your suggestion.
Text corrections	Action: Text corrections applied.