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Natural Hazards and Earth System Sciences
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Discussions

Interactive comment on "Design and implementation of a mobile device APP for network-based EEW systems: application to PRESTo EEWS in Southern Italy" *by* Simona Colombelli et al.

Anonymous Referee #1

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This short paper gives a good description of a newly developed android app to receive EEW messages from existing seismic network-based earthquake early warning system. During passive mode when there is no earthquake, the app serves as a viewer to display recent earthquake near the users. While in active mode, i.e. there is an earthquake detected by the EEW system and the user is close the earthquake, the app will receive the earthquake information message and decide whether to alert or not based on an empirical relationship. It also estimates the duration of the earthquake based on a relationship that extracted from the dataset the authors put together and

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notify the end of the event to the users. After the event, the users can also report their conditions through the app to predefined contacts or social media account. Overall this paper is well written and easy to get the idea of the functionality of the app. Below are my comments/suggestions.

* By design, the app will decide whether to alert to the user or not locally on the phone. This means that the system needs to send a message to all the phones within certain distances. This may not scale well if there are many users within the distance. Maybe add some sentences about why the authors decide this approach on the phone instead of computing on the server and only send to a subset of phones.

* Line 186, 'As for the alert levels, these are progressively updated following the output in terms of location ...', does this also send to all the phones progressively? This sounds not efficient if there are a lot of phones.

* Besides, if the estimated magnitude or the location of the event change (large enough), is that will also change the alert at the users' ends? For example, someone gets a warning due to the computed PGV exceeds the threshold, but a later update with the change of the location/magnitude, then this user's computed PGV value drop below the threshold, the alert cancel? or something else? Please specify in the paper.

* The estimation of the end of the event (or duration of the event) is not convincing without distance. In the supplementary material, it is said several authors have shown that for regional distances, the dependency on distance can be negligible. The references are missing in the supplementary material, please add that.

* Besides, the estimation of the end of the event may seem a little too complicated in real-time and prone to errors (may give wrong directions to users, especially for large earthquake with finite source). For example, based on this equation, an M7 earthquake will have about 75s duration, while if the estimation is M6.5, it will be 50s, which is 25s less. And this is all happening in real-time to the users, and they may use this information to take actions. This seems to contradictory to the findings in (Allen et al.

2018), where simpler and concise messages are preferred. Of course, this is not asking the authors to change this, because everyone has different design philosophy. But sometimes the perspectives from scientists are different from the public's views. I hope the authors can get some feedback from the public users instead of a few academic researchers.

* For this app to work as expected, or a measure of the success of this app, are the delivery time latency and successful delivery rate, which are missing from this paper. Do you have any data about the latency from PRESTo send in the message to the time the phone acknowledge message received? And what's the successful delivery rate, i.e. what percentage of phones do get alert vs not (but supposedly should be). These are some of the key measurements for this type of apps, I hope the authors can add some of these numbers, otherwise, we won't know whether the app is really useful or not.

* How many people are using this app right now? What's the plan for getting more people to use it? Since getting people to download the app is one thing, keeping them using the app is another thing. Do the authors have any plan to attract the public to use it?

* If the user doesn't have location service on (likely for many of the users will do), they will not get a warning?

* Are there any privacy issues of using user's location on phones? How do the authors handle these issues?

* line 120, can you also label the broadbands in figure 1?

* line 158, there is a typo 2-4

Ref: Allen R. et al 2018, Lessons from Mexico's Earthquake Early Warning System, EOS

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