SOIL Discuss.,
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Interactive comment on "Using deep learning for Digital Soil Mapping" *by* José Padarian et al.

Anonymous Referee #2

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I'm not an expert on convolutional neural networks, though I'm rather familiar with other machine learning techniques. As far as I can say from the little knowledge that I have on these subjects, the paper looks good. The methodology is promising and the results are quite accurate. The workflow is correct: data augmentation is a reasonable choice for increasing the volume of data, while the performance of the algorithm is measured with 10-fold cross validation and compared to other machine learning algorithm (Cubist). The predicted values of SOC are rather close to the observed ones, and I guess that estimation time is rather reduced compared to other methods.

From my point of view, incorporating contextual information of the landscape is a very important topic in Digital Soil Mapping.

In summary, the paper is very fine for me.

Minor comments

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Discussion paper

p5 l4 -7 very difficult to follow. P5l 15Âă: Is it possible to predict a set of properties at the same timeÂă? Eg CEC and Clay and C for exampleÂă? P6 l13 ReLUÂă?: not clear p8 l19 10.56 2 timesÂă? Copy paste error? P8 l24Âă: this an important step I think. This should be highlighted in the introductionÂă? Figure 5 : it is very rare to observe lower error in the test dataset than train itself or even validation ? Could you comment on that in the paper ? Section 5.6 The discussion on the prediction of uncertainty needs more global result. I think you can provide a PICP plot using the test dataset to better justify your results.

Reviewer #1 did post his review and I strongly encourage you to answer in particular to his last comment . Thanks in advance,

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