**Novelty: In the paper author(s) claimed that they have claimed that they have proposed the effects of normalization and “3-rows average-subtraction” for detection of underground objects. The proposed method has significantly increased the rate of detection of underground object. But it become difficult to understand the novelty of the paper. It should be highlighted properly.**

*This paper proposes a 3-step method to detect and discriminate landmines: 1) n-row average-subtraction 2) Min-max normalization and 3) image scaling. Row Mean Subtraction (RMS) is a common method in image processing [20] [21]. However, row mean is too much effected from the fluctuations in the current row. And thus, RMS provides lower results than nR for many algorithms tested.*

**Introduction: The introduction is adequate and proper. Through the introduction section a clear idea of the purpose of the underground object detection is given. But author has not clarified the position of their work in relation to the prior work.**

*This article proposes 3-step method. Then, it analyzes the effect and results of the proposed methods. The results show better accuracy performances. For example, for ANN, while Overall Performance (OP) for 1-row average subtraction (1R) is* 85.9%, it increases to 87.3% for 5R. And when 3RM is used, it reaches to 92.2%.

**Content: Definition of assumptions are not adequate. The equation lacking proper notations. Results lacking the position of the work with the prior work. It is better to discuss with some if possible. Although the paper is well written but in some portion it is lacking clarity, which making the paper difficult to understand.**

*All the article has been written from the beginning. The used notations have been first explained*

* *n-row average subtraction (nR): Section 2.2*
* *The test settings: at the beginning of Section 3*
* *Truth table: Section 3.1*
* *Performance measurement and formulas: Section 3.1*

*Then, all algorithms have been tested using the same settings.*

**Figures and Tables: The necessary figures and tables are given in the paper. But till paper is lacking few important figures, figure explanation and tables.**

*Figure 1, 3 and 5 have been redrawn with more details and explained. Figures 5 and 6 from previous version have been merged to Figure 4. Figures 7 and 8 (from the previous version) have been presented as tables now.*

*And the figures are explained more.*

**References: References are not as per DSJ style. The suggestion is to go through the reference list of previously published paper. Specially go through the reference related to conference publications.**

*The references use superscript style now. And, some new references added.*

**Additional Comments for Author(s): Please try to avoid the grammatical mistakes present in the paper. Also try to write sentences correctly with proper meaning.**

*Thanks*

**1. The work in this paper has been carried on underground object detection for ground penetrating radar signals. In the paper author(s) claimed that they have claimed that they have proposed the effects of normalization and “3-rows average-subtraction” for detection of underground objects. The proposed method has significantly increased the rate of detection of underground object. The paper is well written and can easily be understandable. But still there is some mistake or doubt that is making the quality of the paper below standard. Removing the drawback can make the paper far better as of now. The draw back are mentioned below.**

**2. It seems that throughout the paper the author(s) have used lots of abbreviations throughout the paper, which they have mentioned in last page of the paper. Please try to put it just after the abstract of the paper, then it will easy to follow up the paper for the reader.**

*Abbreviations are now given after the first use.*

**3. In the paper the work has been carried out by taking two materials, namely, metal and plastic. Now the reflected wave from these materials is being digitized as an image. As per the paper it is not clear that how you are discriminating the two intensities caused by a reflected wave from these two materials. It will be better to create a table to show the values of intensities/reflected wave frequency for different object depth and antenna height for these two materials.**

*In an article it is difficult to show the values of intensities/reflected. One scan contains approximately 46000 intensity values. And, one object region contains (60-by-90=) 5400 intensity values where each intensity value is a number between 0 and 65535.*

*However, image acquisition has been explained in details and sample images have been given in 2D and 3D format.*

**4. Line stated in the last paragraph of page 3, “But because the object depth and antenna height change, the object is captured in deeper positions”, is difficult to understand. Did you want to state “As the difference between antenna height and object position increase it becomes difficult to track the object” or other? Please state it clearly.**

*For every object depth, images have been acquired using 4 different antenna heights. Both, height of antenna from the ground and the buried object depth effect the detection. It can be seen from Figure 3 that for the same object depth (rows), when the height of antenna changes (columns), the object is detected in deeper positions in the image (and vice versa).*

**5. On page 5 it is written that (180×12) it is not clear to me from where the number 180 arrived**

*On the previous implementation, 12 random image crops have been taken from each of the negative images (TN). 180 represent the number of negative images there. On this implementation, 6 random image crops have been taken from each TN negative image. As a result, there are* $180×6=1080$ *negative images in the tests.*

*This has been explained at the beginning of Section 3.*

**6. It is better to give “=” sign after every “first bracket” where the equations are written. E.g.: “49400 ((2160 + 310) x 20)”. It is better to rewrite as “49400 = ((2160 + 310) x 20)”. Then it will be better to follow up the line for the reader.**

*Thanks. The following style has been used:* $\left(180×6\right)=1080$

**7. Figure 7 is difficult to follow.**

*Figure 7 and 8 (from previous version) are given as Tables now.*

**There it is captioned that “KMeans object detection (left) and TPOD (right).” But in the right figure I didn’t find anything related to TPOD in the right figure. Is it “K Means object discrimination”?**

*For many researchers, KMeans is among top ten algorithms in Data mining [23]. It is an unsupervised clustering algorithm. However, because the number of test objects in three classes are very different, KMeans has been used like a classifier in the tests below. Hence, the cluster with the most number of items (e.g. a cluster with 1000 items) cannot be the cluster for Plastic objects (there are 60 Plastic test objects), the cluster has been assigned as negative. Then, the objects assigned to the cluster has been verified if they have been assigned correctly or not. By this way, the clusters of KMeans have been used like to a classifier.*

**8. The paper will be more easy to understand if you highlight “Parallel band” and “three mentioned rows” properly with necessary indications and marking.**

*Parallel bands have been highlighted, Figure 5.
And, the equation 2 has been explained more.*

**9. Try to put the title of x-axis bellow the line.**

*OK*

**10. In figure 2 try to indicate/highlight the portion indicating the detection of objects.**

*OK*

**11. It is difficult to follow the “equation 1”. Please try to explain the notion of the symbols used in the equations.**

*OK*

$$a\_{A}\left(x,y,z\right)=\frac{1}{R}\sum\_{r=1}^{R}a(x,y,z)$$

*where R is the number of A-scan signals taken and* $a\_{A}\left(x,y,z\right)$ *is the averaged A-scan signal over R scans.*

**12. It is better to write KNN as K-NN.**

*In this version, ANN and SVM is used and KNN is not used.*