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CORRECTION

Correction to: A new approach to snow avalanche rescue using UAV pictures based on convolutional neural networks

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The abstract was missing from this article and should be as given below.

After a snow avalanche, the sooner the victims are discovered and dug out, the better their chances of survival. Advances in robot aerial vehicles have enabled the use of flying machines equipped with sensors and video cameras to estimate damage caused by natural or human-made disasters and detect victims in snow avalanches. The paper develops a way for scanning a descending snow avalanche based on convolutional neural network forms using robot aerial vehicles equipped with video picture sensors and further data processing of the data using picture data processing techniques to find victims of snow avalanches and other associated subjects in real-time. The study formulated the theoretical foundations of the proposed way for scanning a descending snow avalanche based on convolutional neural network forms, involved tests based on the proposed scanning way, and analyzed the proposed deep characteristic-based learning way. A sequence of real-time unmanned aerial vehicle pictures of subjects in snow avalanches was processed by a trained convolutional neural network to produce distinctive characteristics. A trained linear vector machine was integrated into the top of the convolutional neural network to find subjects of importance in real-time. The authors also propose an improvement upon the fore-data processing way to improve the subject detection velocity and an after-data processing way based on a hidden Markov convolutional neural network form to improve prognosis efficiency. Tests performed on two different sets at different resolving power levels showed that real-period subject detection performance improves with increasing resolving power, while computation period increases. The data processing period required to extract the convolutional neural network functions and perform prognosis for a 224×224 input picture is 0.185 s. For both the first and second data sets, detecting at 224×224 resolving power can be performed at 5.4 cadres per second. At video graphics array resolving power and at full resolving power, the detecting rate is 0.9 and 0.36 frames per second, respectively. The results obtained at this stage are planned to be used to increase the likelihood of rescuing people during avalanches.

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