|  |  |  |  |
| --- | --- | --- | --- |
| Title | ReSTiNet: An Efficient Deep Learning Approach to Improve Human Detection Accuracy | | |
| Author(s) Name | Sumit, S. S.; Rambli, D. R. A.; Mirjalili, S.; Miah, M. S. U.; and Ejaz, M. M. | | |
| Contact Email(s) | saef@aiub.edu | | |
| Published Journal Name | *MethodsX* | | |
| Type of Publication | journal | | |
| Volume | 10 | Issue |  |
| Publisher | Elsevier | | |
| Publication Date | December 2022 | | |
| ISSN |  | | |
| DOI | http://doi.org/10.1016/j.mex.2022.101936 | | |
| URL |  | | |
| Other Related Info. |  | | |
|  | | | |

|  |  |
| --- | --- |
| Abstract |  |
| Human detection is an important task in computer vision. It is one of the most important tasks in global security and safety monitoring. In recent days, Deep Learning has improved human detection technology. Despite modern techniques, there are very few optimal techniques to construct networks with a small size, deep architecture, and fast training time while maintaining accuracy. ReSTiNet is a novel small convolutional neural network that overcomes the problems of network size, detection speed, and accuracy. The developed ReSTiNet contains fire modules by evaluating their number and position in the network to minimize the model parameters and network size. To improve the detection speed and accuracy of ReSTiNet, the residual block within the fire modules is carefully designed to increase the feature propagation and maximize the information flow in the network. The developed approach compresses the well-known Tiny-YOLO architecture while improving the following features: *(i)* small model size, *(ii)* faster detection speed, *(iii)* resolution of overfitting, and *(iv)* better performance than other compact networks such as SqueezeNet and MobileNet in terms of mAP on the Pascal VOC and MS COCO datasets.  ReSTiNet is 10.7 MB, five times smaller than Tiny-YOLO. On Tesla k80, mAP is 27.3% for MS COCO and 63.74% for PASCAL VOC. The validation of the proposed ReSTiNet model has been done on INRIA person dataset using the Tesla K80. | |