PRACTICAL WORK : FIRE DETECTION

IA323

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1 OUR SOLUTION

1.1 Data processing

As instructed, we split the validation set into a new training and a new validation set, each containing half of the images.

1.2 Model

Since computational resources were our main concern going into the project, we decided to use pre-trained models in order to save training time. We chose to use ResNet-50, as a compromise between depth and training cost, and because it is widely used. Many sets of pre-trained weights are available for ResNet50, among those we simply used the default included in torchvision (details on these weight are available in the torchvision documentation). Then, we replaced the output layer with a fully-connected layer with an output dimension of 1, to make it suitable for binary classification.

1.3 Training and results

We trained this model on the new training dataset. Since we are allowed to use the labels for this set, we used the standard binary-cross-entropy loss, and the Adam optimizing algorithm. We did not use the original training dataset.
After 10 epochs, the model achieved 96% accuracy on the new validation dataset, which is a rather good result. We added a small section to visualize wrong prediction and it seems that it's hard to predict wildfire in urban area, fields and area with a body of water.