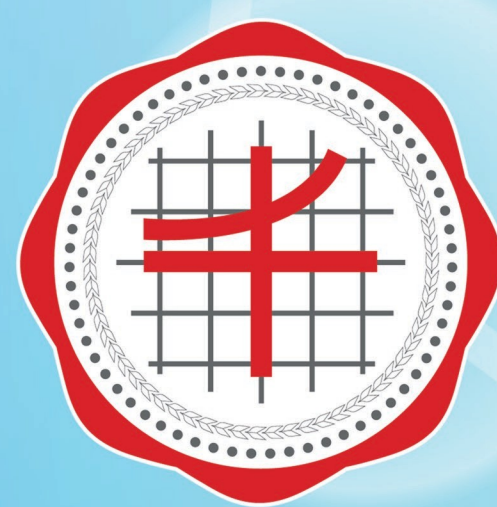




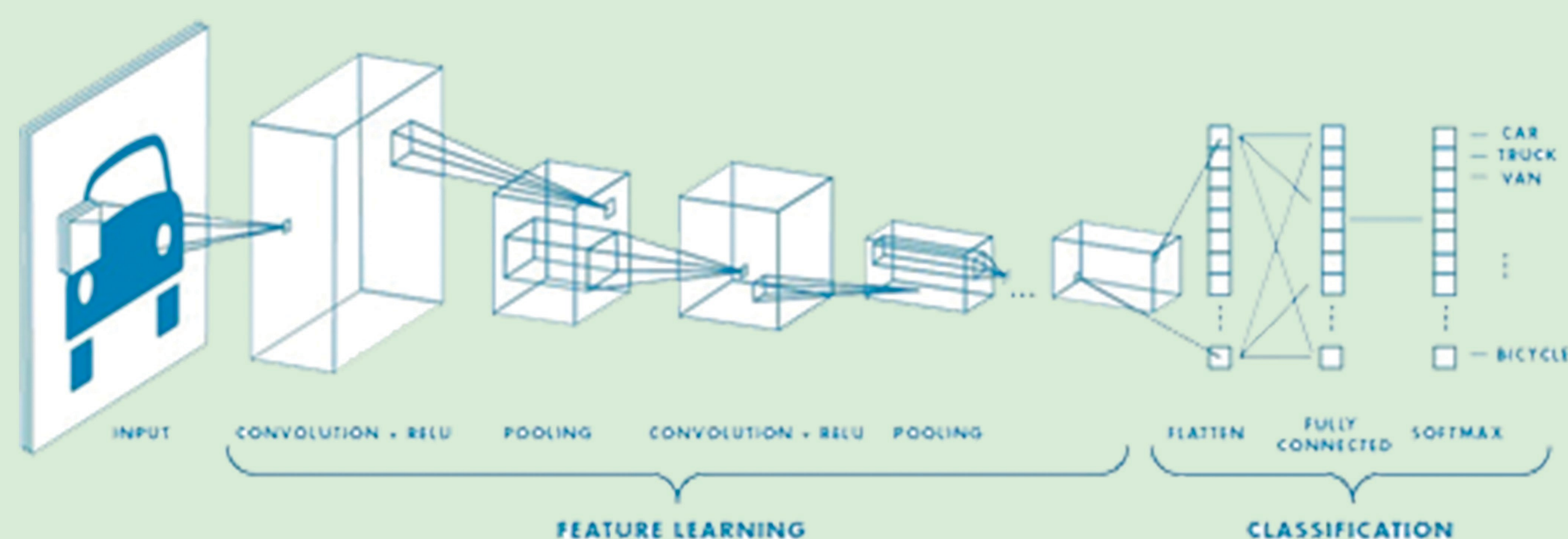
Glaucoma classification by using convolutional neural network

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1. ABSTRACT

Computer vision technology is used to detect an interesting area or interesting objects. However, an operational process requires a lot of processing time to predict the interested object. In addition, some processes are very complex to compute and implement. Moreover, the diagnostic images of the glaucoma stage have to use special medical doctors to analyze. So, this research will propose a convolutional neural network architecture to predict the normal or glaucoma images from optical coherence tomography retinal scan. From the experimental results, the proposed architecture represents the accuracy to predict the glaucoma images about 80 percentage. Therefore, the proposed architecture is a useful assistant to diagnose the retinal images.

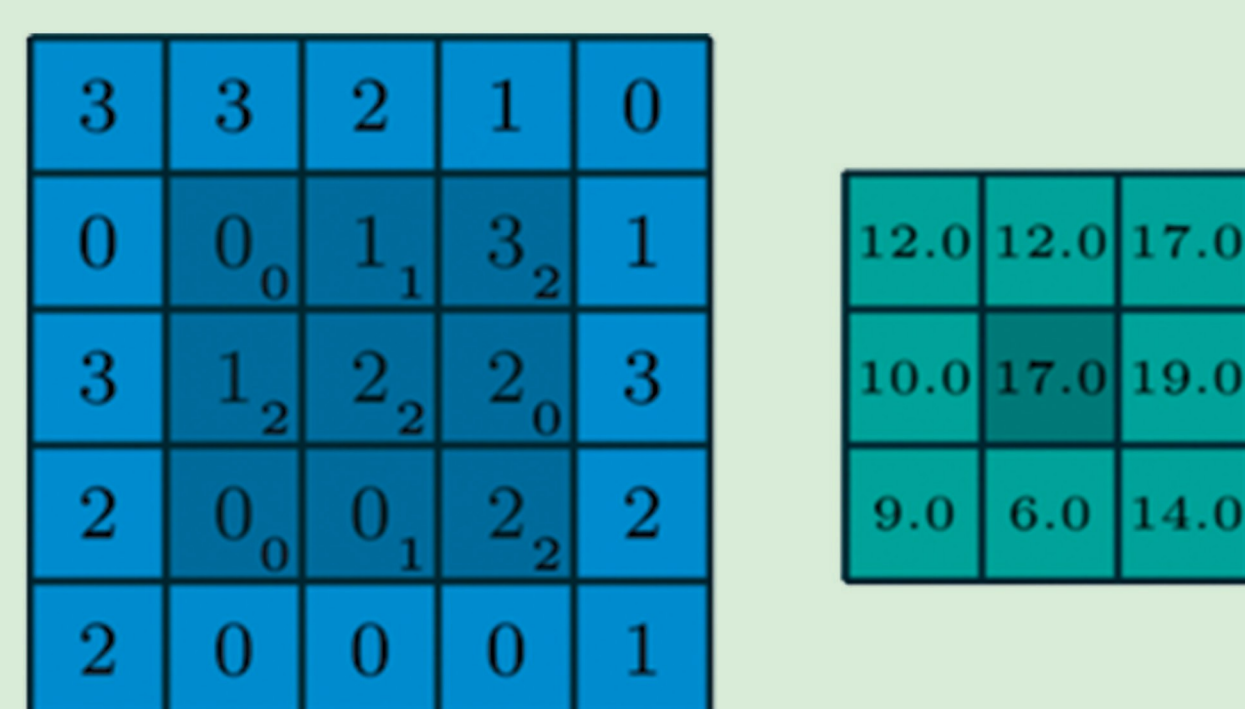
2. Convolutional Neural Network, CNN



CNN is a deep learning algorithm consists of :

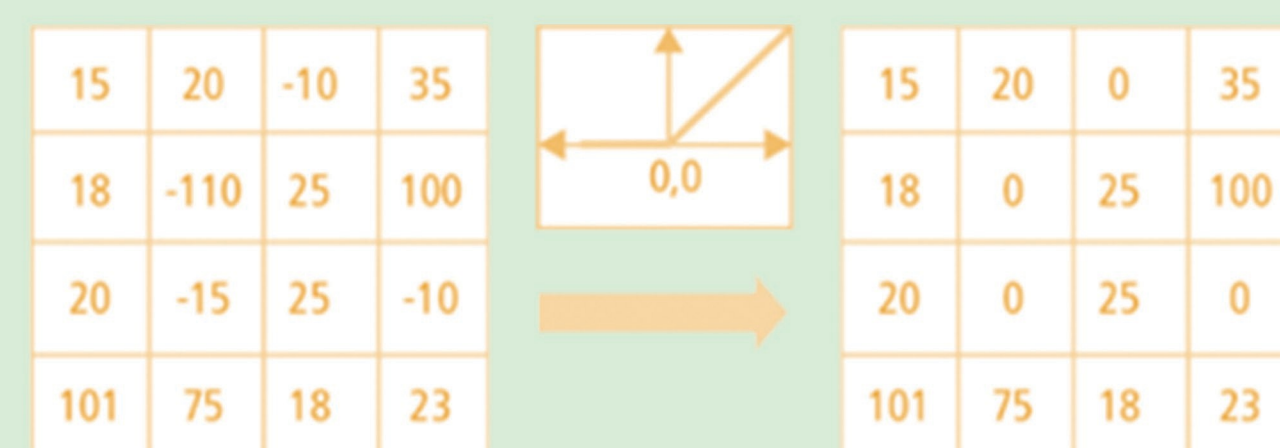
Step 1 : Convolution operators

- Filter an input data to create the many filtered output
- Create the filtered data based on the window size



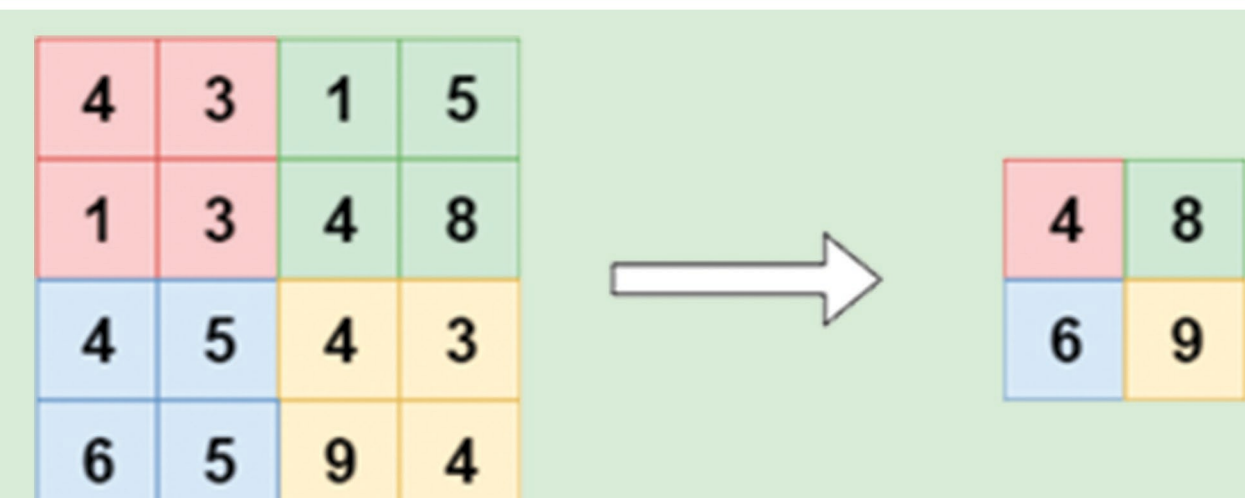
Step 2 : Activation function

- Manage each filtered data to propose the designed output



Step 3 : Pooling operators

- Decrease the data size
- Represent the major information

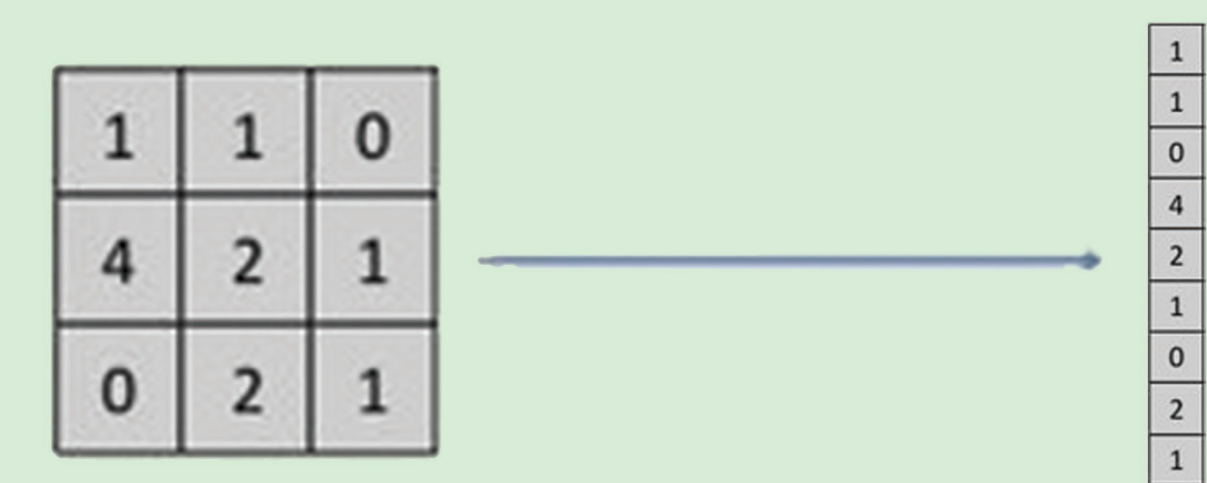


Step 4 : Repeat 1-3

- Repeat analysis the each layer

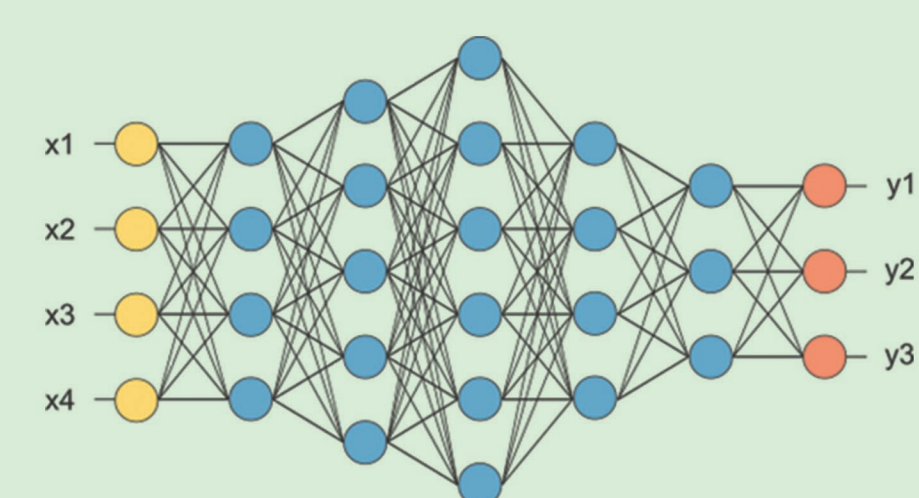
Step 5 : Flattening data

- Rearrange the data from 2D matrix to a vector

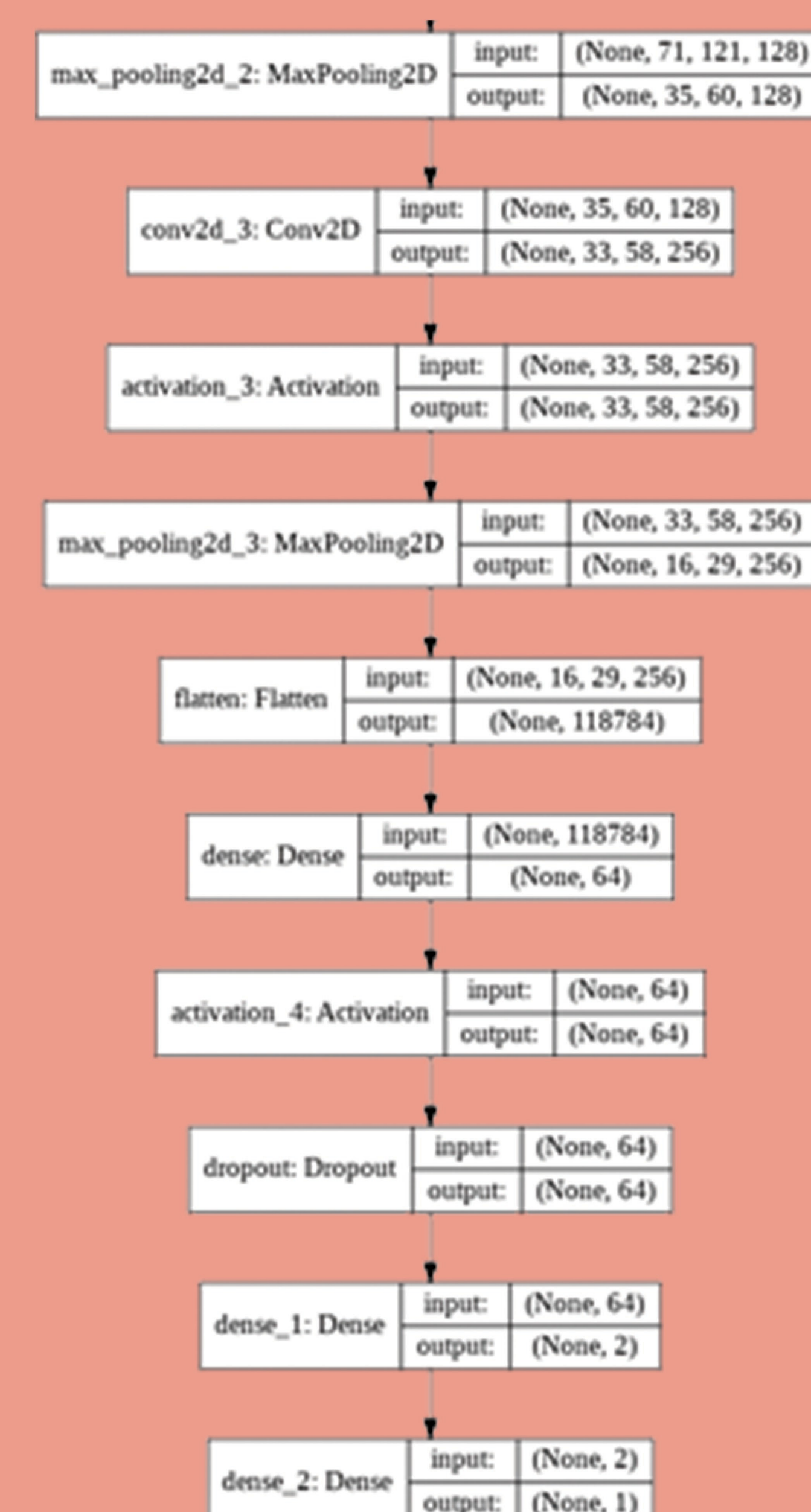
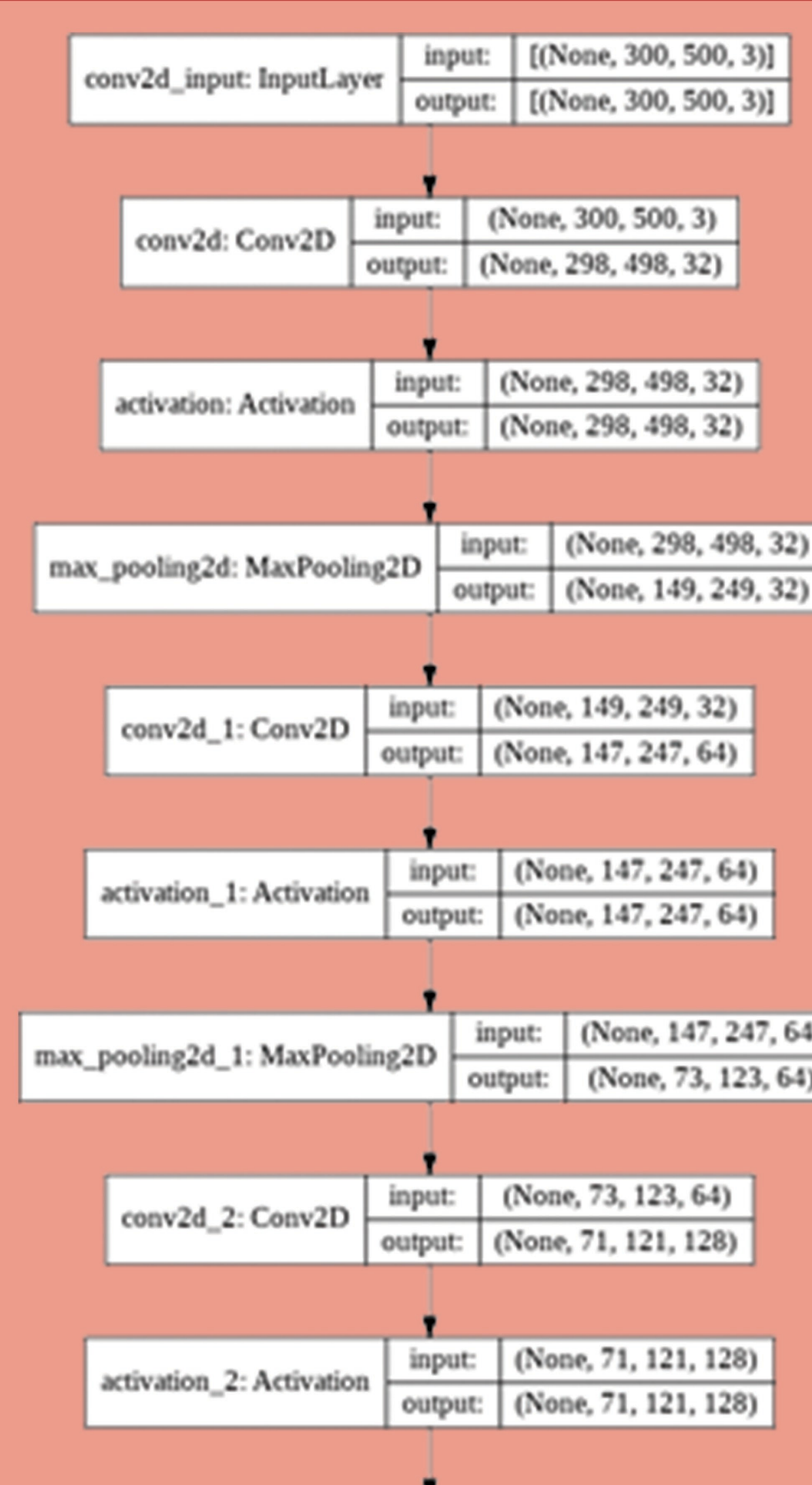


Step 6 : Fully connected data

- Analysis the each flattening data
- Create a result of neural network



3. The proposed method



4. Experimental Resultsorem Ipsum

- Reults : The experimental result of the proposed CNN

```
{'A_Glaucoma': 0, 'A_Normal': 1}
[[0.]]
GLACOMA
{'A_Glaucoma': 0, 'A_Normal': 1}
[[1.]]
NORMAL
```

1/1 [=====] -
Model's Evaluation Metrics:

Accuracy: 0.8170731663703918
Loss: 3.3425087928771973

has the accuracy of the classification that is 81 percentage

■ Comparing the other architecture networks

- Proposed method
- VGG 16 model
- MobileNetV2
- MobileNet Ex2
- EfficientNet B0
- Xception
- Inception
- Restnet

■ The results of comparing algorithms

Network Model	Accuracy
Proposed model	0.81
VGG 16 model	0.33
MobileNetV2	0.32
MobileNet Ex2	0.30
EfficientNet B0	0.30
Xception	0.29
Inception	0.33
Restnet	0.32

5. Conclusion

- This research proposed a new CNN model for classification the glaucoma.
- The experimental results represented the proposed model that has the most accuracy to 81 percentage.
- The proposed model implemented the main steps of CNN that consists of convolution operator, activation function, pooling operator, flattening and fully connected data to create a new model.

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