

# Deep Learning for medical usages

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## INTRODUCTION

- Currently PhD. Student on Institute of Robotics and Cybernetics
- Dissertation thesis: Screening for diabetic retinopathy on retinal images
- Bachelor's and Master's degree achieved on study program of Applied Informatics
- Fields: Machine and deep learning in medicine, medical software developing

## REFERENCES

### Diploma thesis:

Mácsik, Péter -- Pavlovičová, Jarmila  
Retinal Images Processing for Medical Diagnostics, 2020  
(Detection and classification of eye diseases, specifically diabetic retinopathy with Deep Learning algorithms)

### Bachelor thesis:

Mácsik, Péter -- Bucz, Štefan  
Design of Algorithms for the Autonomous Control of Motion Systems, 2018  
(Algorithms of computer vision, specifically Lane detection and traffic sign recognition)

## RESEARCH

Since diploma thesis I have been working mainly on detection and classification of eye diseases, especially diabetic retinopathy (DR) with Deep Learning algorithms.

Future research will continue with segmentation algorithms and with attempts to detect another diseases (i.e. eye, brain).

### Diabetic retinopathy classification with alternative LBC layers

During diploma thesis I made experiments for classification of diabetic retinopathy on fundus images. Thesis contains comparison of well-known CNN and its new alternative LBCNN [1] which contains LBC layers (Fig. 1.). These layers contain fixed, non-learnable filters and learnable 1x1 convolution filters which enable learning with less parameters. Article for classification of DR with alternative LBC layers is currently in progress. Reference will be added later.

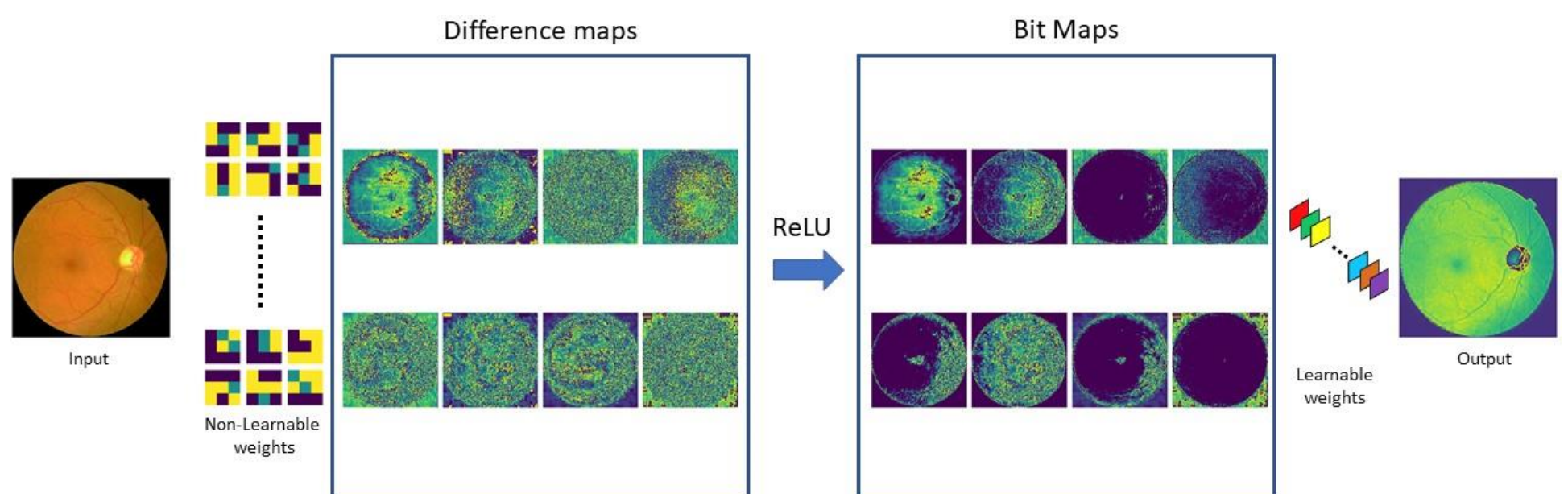


Fig. 1.: LBC layer

### References:

[1] JUEFEI-XU, Felix, BODDETI, Vishnu Naresh a SAVVIDES, Marios. 2017.

"Local binary convolutional neural networks." Proceedings of the IEEE conference on computer vision and pattern recognition.