Choroid neovascularization (CNV) refers to the proliferating vessels from choroid capillaries, expanding through the tear of the Bruch membrane. These blood vessels will underneath the retina and leak which is a characteristic feature of age-related macular degeneration (AMD) , usually resulting in vision loss, visual distortion or even blindness. CNV is common in adults over 60 years old and ought to receive treatment as soon as possible.

Recently, lots of advanced methods using for medical diagnosis have been raised. Li et al. generated a random forest model to detect CNV region by extracting the 3d-HOG feature. Zhu et al. proposed a CNV growth prediction with treatment based on reaction-diﬀusion model in 3-D OCT images. Feng et al. designed a novel context pyramid fusion network(CPFNet) for sementic image segmentation to fuse global and multi-scale context information. Meng et al. proposed a multi-scale information fusion network(MF-Net) for CNV segmentation to catch multi-scale deformation of the targets and aggregate contextual information.

Though deep learning techniques have made great achievements in CNV medical diagonosis in the last few years. However, it’s hard for existing methods to get satisfactory results due to the specificity of CNV lesions. The difficulty of segmentation are as follows. (1)Structurally, lots of CNVs are small while some methods are disabled to capture features of small object, which may got lost in the process of multiple convolution and pooling layers. In addition, various shapes of CNV are also a big challenge which requires model to have good robustness. (2)Visually, CNV has similar contrast with background, making it difficult to achieve accurate classification between CNV foreground and backgound. Besides, some vessels are often blurred by fluid exudates and hemorrhage, resulting in few quantitative basis for CNV segmentation.

In order to tackle these issues above, we proposed a convolutional neural network with the guide of classification, which is capable of automatically achieving accurate CNV segmentation results in OCT images. A pyramid mixed pooling (PMP) module referred to PSPNet is designed and integrated to an encoder-decoder structured network to get the context and detailed information within OCT images. Considering other diseases and background are similar with CNV in contrast, we added a classification supervised branch, which effectively prevents the model from misjudgment. The results on our own dataset demonstrate the advantage of our proposed algorithm.